

APRIL 18, 1936

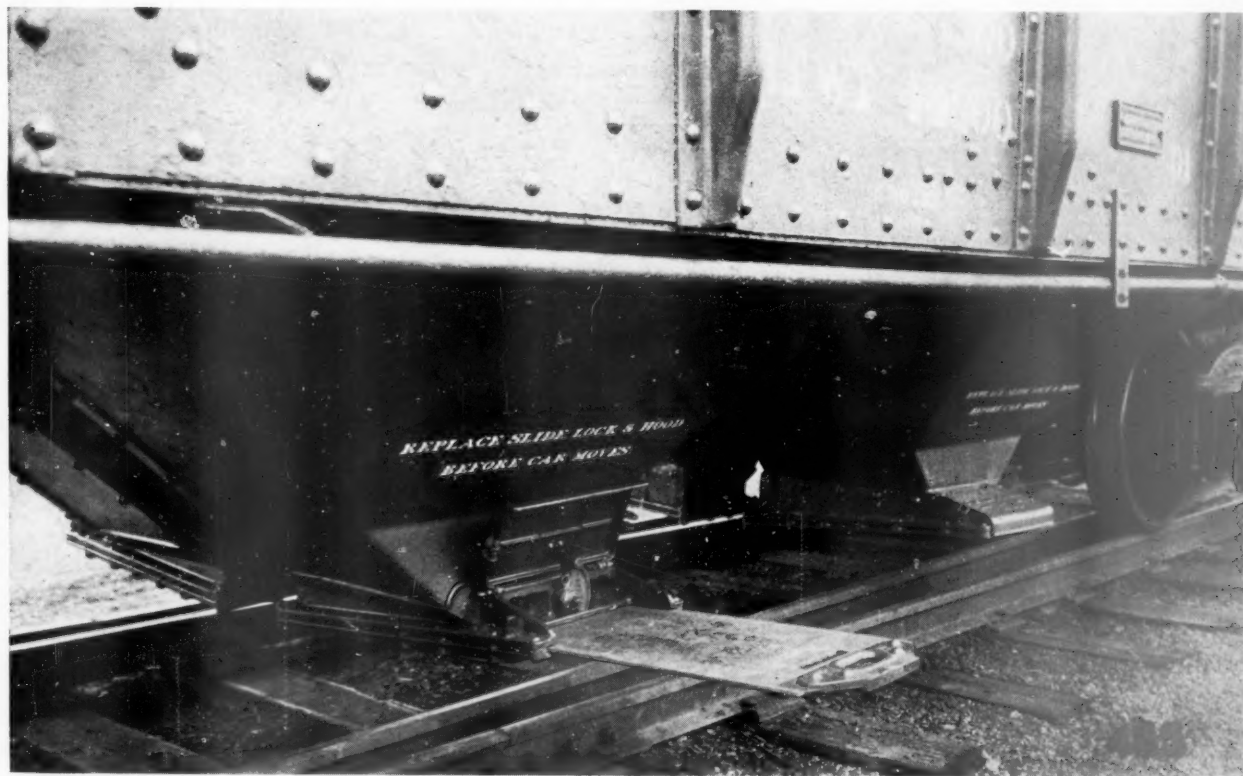
Railway Age

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RAILWAY AGE

Who Shall Manage the Railways?

There is nothing so amazing about the present transportation situation as the continuing and often successful efforts of government and organized labor to increase, rather than reduce, the restrictions and burdens upon railroad management, and the tolerance with which such efforts are regarded by political and business interests and the public.

Regulation of railways was based originally upon the assumption that they had a monopoly—an assumption plainly not tenable after they have been confronted for years with competition on every side by air, highway and water. Why continue increasing government interference with an industry after the principal original reason for it has ceased to exist? It was originally assumed that regulation should be directed entirely to promoting the public interest, whereas most of the recent increased government interference with railway management adopted or proposed has been plainly for the benefit of special interests, or even ostensibly for the benefit of the railways themselves.

These recent often successful efforts to increase the restrictions and burdens upon railway management have been and are being made and tolerated when a nationwide campaign of propaganda is being conducted to reduce and prevent government interference with other industries upon the ground that freedom of private initiative and enterprise is the principal thing required to restore and increase prosperity.

Increased Competition—and Increased Government Interference

There seems to be almost no recognition outside the railroad industry of the fact that railroad management needs freedom to solve its problems as much as does the management of any other industry, and that the more the freedom of management is restricted the less justification there can be for criticism of it if it does not solve its problems in ways conducive to the public interest. Increased and increasing competition with the railways by carriers that are subsidized without being regulated, should constitute, it would seem, the strongest possible argument for reducing restrictions and burdens that handicap their managements in efforts to improve service and reduce operating costs and rates—the only means of effectively meeting competition.

But organized railway labor, at a time when there

are still 700,000 less railway employees than in 1929, has been securing and is still seeking more and more legislation to increase operating costs and to thereby more and more handicap railway managements in their efforts to meet competition. It has secured the railroad retirement acts. It is promoting legislation to require 8 hours' pay for 6 hours' work, to limit the length of trains, to increase the size of train crews, and to compel the continued compensation of employees retired from service because of unifications demanded by the government's Co-ordinator of Transportation.

And why should the government, through a Co-ordinator of Transportation, be trying to compel railway unifications? It is plain that economies effected in this or any other way would better enable the railways to meet outside competition. But under a regime of freedom it would be recognized as a function of management to devise means of meeting competition. Why should the government first increase competition with the railways by discriminating against them as regards regulation and subsidies, and then try to coerce their managements into adopting means devised by government officials for meeting that competition? Why should not government abolish the unequal terms of competition created by its own policies, and then let management manage the railways?

Commission Also Tries Management

Recently the Interstate Commerce Commission, presumed by the laws giving it authority to be only a regulatory body, but apparently made jealous by the activities of Congress and the Co-ordinator of Transportation in the field of management, has also invaded that field and succeeded in showing the grossest inconsistency in its efforts to exercise managerial functions. Last summer it declined to allow the railways to make lower rates on automobiles to the Pacific Coast than to intermediate points. In the Fifteen Per Cent Case in 1931 it had said, "So far as rates are concerned, it is clear that the present structure has developed under principles and theories which gave no thought to the competitive agencies of transportation which now exist. * * * It is evident that the traffic departments must give new thought to the rate structure in the light of existing conditions."

Commissioner Mahaffie, in dissenting in the auto-

mobile case, said, "The earnings under the rates proposed compare favorably with rates approved in other cases, and in some instances prescribed by us, as maximum reasonable rates." He added, "The applicants have followed our advice"—that given in the Fifteen Per Cent Case. * * * "Non-competitive business will no longer support an adequate rail service. The railroads have a right, as I see it, to compete on reasonably even terms for the traffic of the country. In my opinion, such decisions as that of the majority in this proceeding deny them that right."

Only seven months later, in the Eastern Passenger Rate case, the commission ordered reductions upon the grounds that they were needed to enable the railways to meet outside competition, and would increase their net earnings. In the automobile case it refused to allow railway management to make reductions of rates which management claimed would increase net earnings. In the passenger rate case it ordered management to make reductions which management contended would reduce net earnings.

Reason for Government Interference Reversed

Thus we see Congress, the Co-ordinator of Transportation and the Interstate Commerce Commission all exercising, or being urged to exercise, functions that are recognized as functions of management in every other industry that is subject to competition. And we see them exercising, or trying to exercise, most of these functions upon the ground that *competition* has made such changes in transportation conditions as to necessitate changes in railway management. Originally government interference was advocated upon the ground that *lack of competition* in transportation made government interference necessary in the public interest. Now increased government interference is defended upon the ground that there is so much competition in transportation that it is unsafe for the railways as well as the public for the railways to be allowed to manage themselves!

We are confronted with three distinct questions regarding the relations of government with transportation. First, is it to be regulated in future, as originally intended, solely to protect the public interest, or for the benefit of every special interest that any government agency may think needs its paternal care? The demands of organized labor for legislation to increase operating expenses are obviously not intended to promote the public interest, but to further the supposed interest of railway employees mainly at the cost of the public which has to pay passenger and freight rates. Who does Congress represent—labor leaders or the public?

Second, is government going to interfere in transportation further to increase, or to reduce, the present government-made handicaps to which the railways are subject in trying to meet the competition of other carriers by air, highway and water?

Third, is the government or railway management going to determine the policies and methods followed by

the railways in their efforts to meet outside competition?

A Record of Railroad Achievement

The railways are still suffering severely from the depression. Gross earnings in the first two months of the year were still 38 per cent less than in 1929. But operating expenses, in spite of advances in wages and prices during the depression due to government policies, and of abnormally severe weather, were 35 per cent less than in 1929. Net operating income was still 57 per cent less than in 1929, but was 44 per cent larger than in the first two months of 1935, and the largest in the first two months of any year since 1930.

The record made in controlling operating expenses and increasing net operating income, in spite of almost every adverse natural and man-made condition conceivable, is attributable entirely to the efforts of railway management. It is highly discreditable to business men and the public that, in the face of such a record of achievement, railway management should be constantly subjected to criticism for alleged inefficiency, and should be still in the process of being hampered by increasing restrictions and burdens. In view of the actual record, it would seem that every person of intelligence who desires the maintenance of private ownership and management would be advocating policies that would afford private management more opportunity to reduce the cost and improve the service of transportation.

The time has come to settle definitely who is going to manage the railways. They should be managed either by the government or by managements representing the private owners of their securities. As the public unquestionably favors private ownership and management, it should compel a cessation of legislation increasing operating expenses and of efforts of government officials to constitute themselves the management.

As pointed out in these columns last week, the issue is squarely joined by two bills now pending in Congress—the Pettengill bill to repeal the long-and-short-haul law and give railway management more freedom to meet competition in rates, and the Wheeler-Crosser bill to deprive management of virtually all its remaining authority by forbidding every railroad, without the approval of the Interstate Commerce Commission, to reduce service or curtail activities of any kind to effect economies without paying employees who would be displaced by such measures.

Public sentiment can cause government either to reduce or increase the freedom of railway management to perform the functions that every management of an industry must be free to perform if it is to conduct its affairs efficiently and in the public interest. For the public to tolerate constant increases in the restrictions and burdens upon railway management when it is confronted with competition on every hand, and then criticize railway management for alleged inefficiency in meeting competition and in serving the public, simply does not make sense.



Illinois Central 171-Ton, 1,800-Hp. Diesel-Electric Locomotive

Illinois Central 1,800-Hp. Diesel-Electric Transfer Locomotive

Welded underframe and six-wheel trucks with draft gears attached
feature Ingersoll-Rand-General-Electric unit

THE Illinois Central placed in service in March an 1,800-hp. Diesel-electric locomotive built for freight transfer service. The main power plants consist of two 900-hp. Ingersoll-Rand Diesel engines with General-Electric electrical equipment including generators, traction motors and controls. The total weight of the locomotive is 342,000 lb.

The power plants are mounted on a welded, fabricated-steel underframe, the principal members of which consist of four H-beam sections 24 $\frac{1}{4}$ in. deep, weighing 120 lb. per ft. Portions of the webs of these beams were reconstructed by cutting and welding to secure a member tapering toward the frame ends. The floor sheets are of $\frac{3}{16}$ -in. steel with openings for well construction at the engine location. The cab is of steel, welded, with radiators at each end for cooling the circulating water and oil from the engine.

The entire locomotive is carried on two six-wheel power trucks having Commonwealth cast steel frames. An interesting feature of these trucks is the fact that the draft gear is attached directly to them. By this design pulling stresses are carried through the underframe for only one truck.

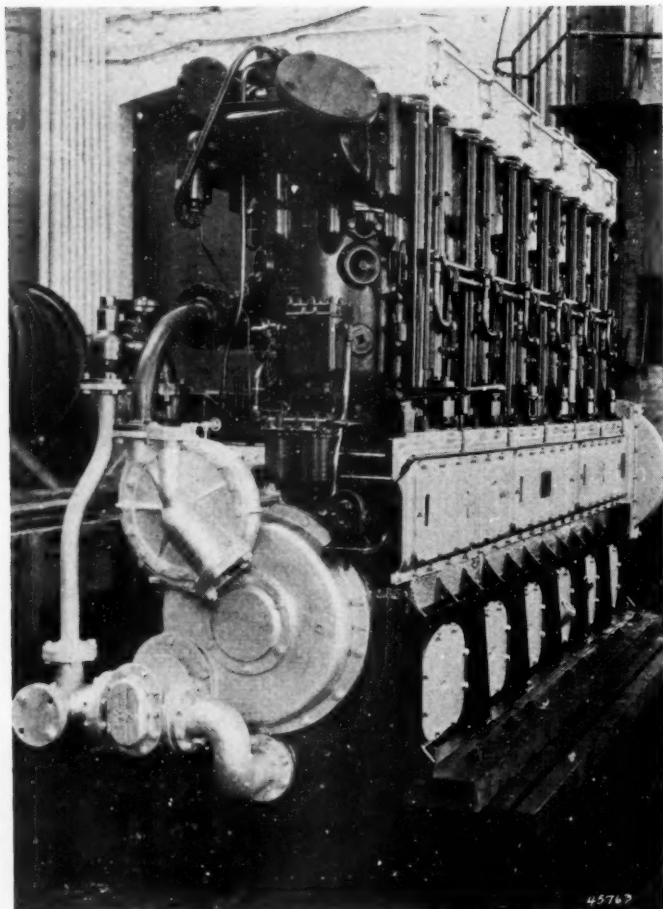
The Diesel Engines

The Ingersoll-Rand Diesel engines are of the six-cylinder vertical trunk-piston, single-acting type operating on

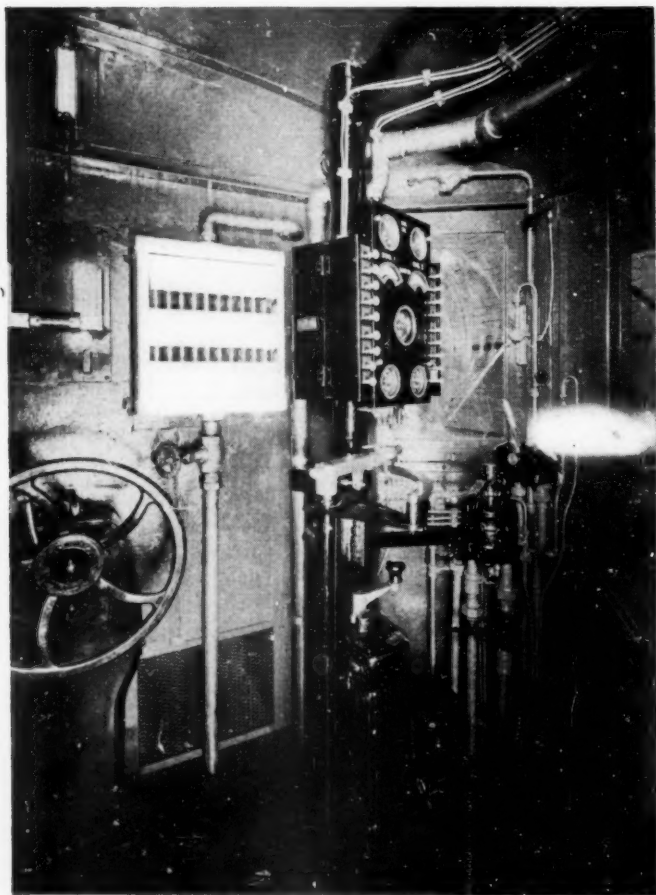
the four-stroke cycle with direct fuel injection. The bore and stroke are 14 $\frac{3}{4}$ in. by 16 in. They have a rated output of 900 brake hp. at 550 r.p.m. The engine sub-base is of welded steel construction and extends the full length of the engine housing forming the oil sump and support for the entire engine. The engine housing is a steel casting bolted to the sub-base and forms the main support for the crankshaft, camshaft and cylinders. The camshaft side of the housing is enclosed with a large aluminum cover which has six inspection doors in it. The rear side of the housing also has six large doors through which adjustments to the crank pin bearings can be made.

Each of the six cylinders is a separate casting with integral water jackets, which are provided with eight hand-holes for cleaning. Each cylinder is secured to the housing by twenty cylinder studs through the bottom cylinder flange. The cylinder heads are secured by eight studs in each cylinder. Cooling water enters the cylinder jackets at a point about two-thirds the distance from the bottom of the jacket to the top of the cylinder.

The cylinder heads are constructed so as to incorporate the inlet and exhaust manifolds. The adjoining sides of the heads are flanged and are bolted together with a metal-to-metal joint. One injection spray nozzle is held by clamps in each side of the head. Cooling water is admitted to the cylinder-head water jackets



One of the Ingersoll-Rand 900-Hp. Engines



One of the Two Control Stations on the Illinois Central Locomotive

through two connections on the outside of the engine. The joint between the cylinder head and the cylinder is sealed by a copper gasket. The cylinder heads each contain one inlet and one exhaust valve which are actuated by push rods and rocker arms mounted on the heads. The valve actuating mechanism is completely enclosed and is lubricated by oil under pressure. The excess oil from the valve mechanism is drained back through the push-rod tubes to the crankcase. The inlet valves are of low-carbon steel and the exhaust valves are of silchrome steel. Each valve has two coil springs.

The crankshaft is a one-piece steel forging having six cranks and seven main bearings. The cranks are arranged in three pairs 120 deg. apart. The crank pins are hollow and the crankshaft counterweights are secured to the butt end of each crank arm. The camshaft is driven from the generator end of the crankshaft through spur gears. The camshaft assembly includes the governor gear, inlet- and exhaust-valve cams, fuel-pump cams and over-speed governor. The entire length of the camshaft is ground to size and polished.

One of the seven main bearings serves as a lateral thrust bearing. Each bearing consists of an upper and lower steel shell lined with babbitt. The bearing at the generator end has flanges faced with babbitt to take the lateral thrust. The connecting rods are forged steel machined all over. The piston-pin bearing is a bronzelined bushing pressed into the eye of the rod. The connecting rod bearings are interchangeable steel shells lined with babbitt. Adjustment is made by shims and the caps of each connecting-rod bearing are held in place by four alloy-steel bolts. The pistons are one-piece steel castings with babbitt on that portion of the skirt below the bottom compression ring. The top of the piston is so constructed as to form the combustion space. The piston pin is of the full-floating type and is located endwise by cover plates on the piston, held by a through bolt. Each piston has five compression rings above the pin and two ventilated oil-drain rings below the pin.

The engines are equipped with six Bosch fuel-injection pumps which deliver properly timed and measured quantities of fuel to the cylinders. The fuel injection pumps receive fuel at low pressure from a header extending along the engine. Each pump delivers fuel at high pressure to the two spray nozzles of the cylinder which it supplies. The spray nozzles, each having a single orifice, are located on opposite sides of the cylinder head and direct the fuel into the combustion space.

The speed of the locomotive is controlled from the operator's position at either end of the locomotive by a manually operated throttle, which is mechanically connected to the oil-engine governor. A Woodward governor, driven by bevel gears from the camshaft, controls the engine speed through a mechanical connection to the fuel injection-pump control shaft. This governor consists of small centrifugal weights, which operate a pilot control valve for a hydraulic piston, power for which is furnished by a self-contained gear-type oil pump. The governor is entirely enclosed, the housing forming an oil sump for the hydraulic mechanism.

The connection between the engine and generator is a flexible coupling of the laminated-disc type which takes care of any angular misalignment between the engine and generator. The weight of the armature is divided between the flexible coupling and the generator bearing.

All moving parts of the engine are lubricated by a pressure-feed system supplemented by splash and sprays from the pressure-lubricated parts. The lubricating-oil supply is stored in the sump of the engine sub-base. A lubricating-oil pump located at the front end of the engine and driven from the crankshaft through spur

gears draws oil from the sump through a welded sheet-metal duct and delivers it to cooling radiators from which it passes to the engine bearings. Strainers in the engine sub-base filter the lubricating oil before it is recirculated. Oil pressure is regulated by a spring-loaded relief valve in the oil piping between the engine and the cooling radiators. A lubricating-oil safety switch, wired into the electrical control circuit, is furnished to stop the engine in case of loss of oil pressure.

The engine cooling water is circulated by a centrifugal pump located at the front end of the engine. This pump delivers cooling water to the water jackets of the cylinders and cylinder heads, and thence to the radiators.

General Characteristics

Total weight	342,000 lb.
Weight, per axle	57,000 lb.
Tractive force, continuous at 13.8 m.p.h.	38,800 lb.
Tractive force, one hour, speed 12 m.p.h.	44,400 lb.
Tractive force, 30 per cent adhesion, speed 3.7 m.p.h.	102,600 lb.
Maximum speed	69 m.p.h.
Length, between coupler knuckles	60 ft. 0 in.
Total wheel base	48 ft. 0 in.
Truck centers	37 ft. 4 in.
Rigid wheel base	11 ft. 0 in.
Truck wheel centers	5 ft. 6 in.
Wheel diameter	39 in.
Width over cab side sheets	10 ft. 0 in.
Heights from rail:	
Overall	15 ft. 2 in.
Cab floor	5 ft. 10½ in.
Capacity of fuel oil reservoir	1,150 gal.
Capacity of lubricating oil reservoirs, (one engine)	200 gal.

From the radiators the water is piped back to the circulating pump.

The engine is started electrically by motoring the generator from energy supplied by the storage battery. While this is being done compression in the engine cylinder is released by a mechanism which holds the exhaust valves off their seats.

A centrifugal-type over-speed governor is driven from the camshaft and operates on a safety switch wired into the electrical control circuit.

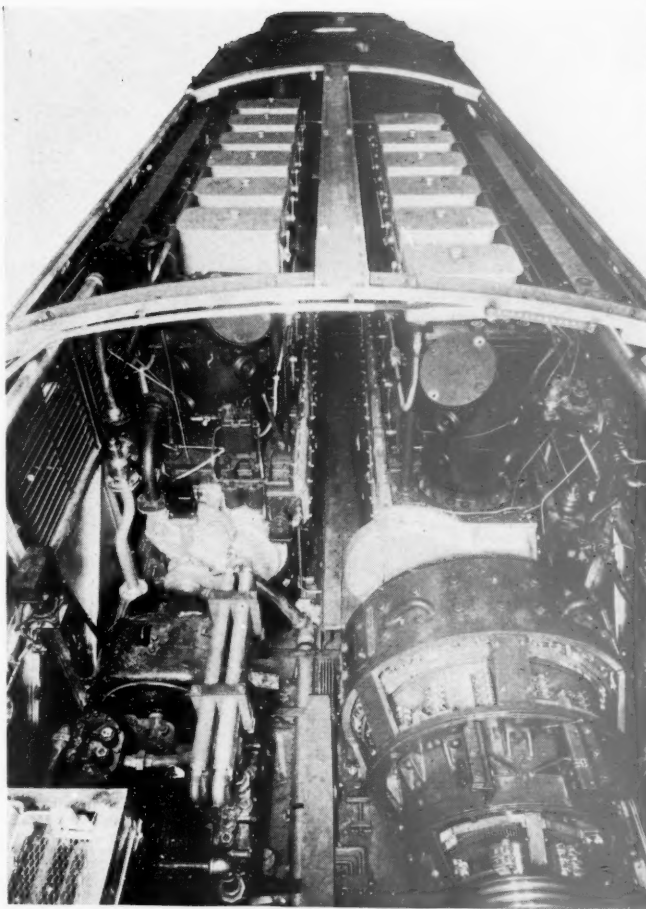
The over-speed safety switch contacts are connected in series with the lubricating-oil safety switch and a shut-down solenoid, which is mounted on the governor housing. When all of the contacts are closed and the electrical circuit is complete, the solenoid is energized and allows the fuel-injection pumps to be under governor control. Opening any of these contacts, or failure of the circuit, will stop the engine.

Electrical Transmission

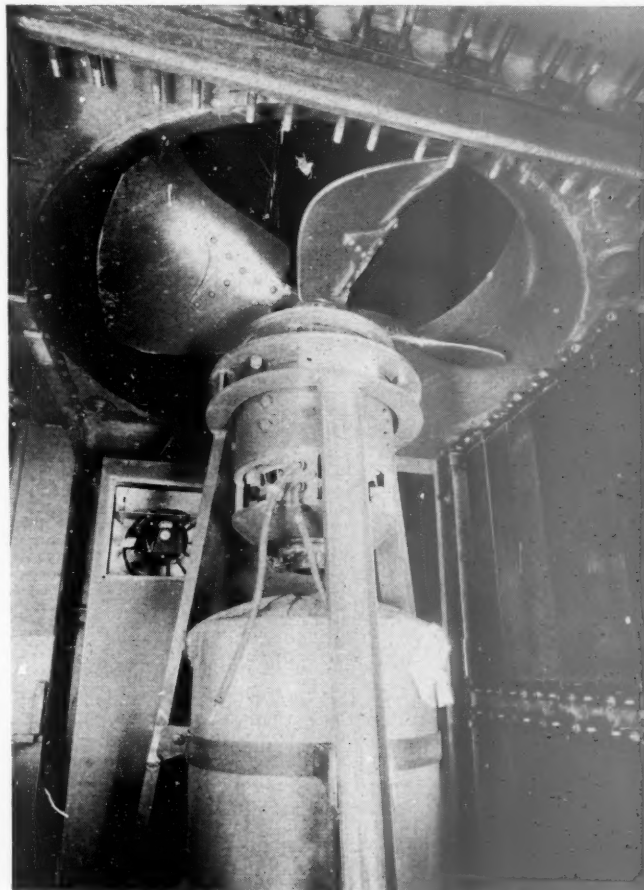
The two engines are placed side by side in the central portion of the cab and a traction-type direct-current generator is directly coupled to each of the engines, with a 125-volt constant-voltage auxiliary generator carried on an extension of the main generator shaft. Mounted on top of the auxiliary generator and belted to the main shaft is an exciter set which is used exclusively for supplying variable current to the main-generator fields. A flexible coupling is used between the engine and the main generator.

The electrical connections for the generating units differ somewhat from the usual practice with dual-engine locomotives, in that the generators are connected in series with the mid-point grounded. Thus the motors can be supplied with the full voltage of both generators but with half voltage to the ground.

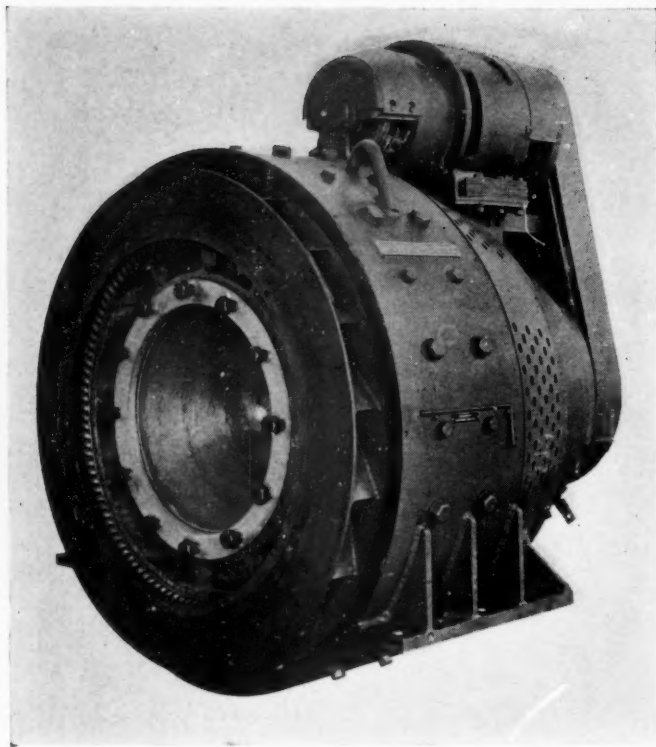
The traction motors are type GE-716, with a maximum gear reduction of 62 to 15. The design permits a maximum locomotive speed of 60 m.p.h., calling for a motor speed of 2,140 r.p.m. The motors are of the usual single-gear traction-type, the one side carried



Looking Down on the Locomotive with Hatch Covers Removed—At the Right Is Seen One of the Main and Auxiliary Generators (The Exciter Is Not in Position) and at the Left Is the Air-Brake Compressor



One of the Vertical Propeller-Type Radiator Fans



Assembly Including Traction Generator, Auxiliary Generator and Belt-Driven Exciter—The Generator End of the Flexible Engine Coupling Is Shown at the Left

on the axle and the other supported by a flexible nose suspension on the truck transom.

Double-end General Electric Type P control equipment is provided, arranged for single-unit operation. The control is arranged for three motor combinations with automatic transition. In the first combination, three motors are connected in series, and two such sets in

Partial List of Specialties

Power plant	Ingersoll-Rand Co., New York
Storage battery	General Electric Co., Schenectady, N. Y.
Traction motor fans	Electric Storage Battery Co., Phila., Pa.
Friction side bearings	American Blower Corp., Detroit, Mich.
Radiators	General Electric Co., Schenectady, N. Y.
Radiator fans and fan motors	Modine Mfg. Co., Racine, Wis.
Truck frames	General Electric Co., Schenectady, N. Y.
	General Steel Castings Co., Granite City, Ill.
Driving wheels	Edgewater Steel Co., Pittsburgh, Pa.
Foundation brakes	American Brake Co., St. Louis, Mo.
Air brakes	New York Air Brake Co., New York
Hand brakes	National Brake Co., Buffalo, N. Y.
Coupler and coupler yoke	National Malleable & Steel Casting Co., Cleveland, Ohio
Draft gear	W. H. Miner, Chicago
Air brake compressors	General Electric Co., Schenectady, N. Y.
Exhaust mufflers	Burgess Battery Co., Freeport, Ill.
Air-intake filters	Air-Maze Corp., Cleveland, Ohio
Flexible connections for air and steam	Parco Mfg. Co., Chicago
Cab heaters	Rome-Turney Radiator Co., Rome, N. Y.
Cab heater motors	General Electric Co., Schenectady, N. Y.
Steam pipe and cab insulation	Johns-Manville Corp., New York
Steam end valves	Vapor Car Heating Co., Chicago
Sanders	Viloco Railway Equipment Co., Chicago
Lubricating oil filters	Wm. W. Nugent & Co., Inc., Chicago
Thermometers	Moto Meter Gauge & Equipment Corp., Des Moines, Ia.
Pressure switches	Penn Electric Switch Co., Des Moines, Ia.
Lubricating and fuel oil gages	Consolidated Ashcroft-Hancock Co., Bridgeport, Conn.
Bell ringer	Transportation Devices Co., Indianapolis, Ind.
Wind deflectors	Prime Mfg. Co., Sidney, Ohio
Fire extinguishers	Phister Mfg. Co., Cincinnati, Ohio
Horns	Leslie Co., Lyndhurst, N. J.
Headlights and marker lights	Pyle-National Co., Chicago

parallel; in the second combination, two motors are connected in series, and three such sets in parallel; in the third combinations all six motors are connected in parallel. All these connections are made with full motor

field, and no reduced field connection is used. The regulation of the generator fields, and the changing of the motor combinations is automatically controlled, so as to utilize the maximum permissible engine output for any throttle position.

Should one of the engines be shut down, it is still possible to obtain maximum tractive force and thus to handle the usual weight of train, but at reduced speed, by cutting out the unused generator. Protection to the equipment in case of a ground is provided by a grounding relay which removes the excitation on the main generator fields. The auxiliary generator is protected by an over-voltage relay.

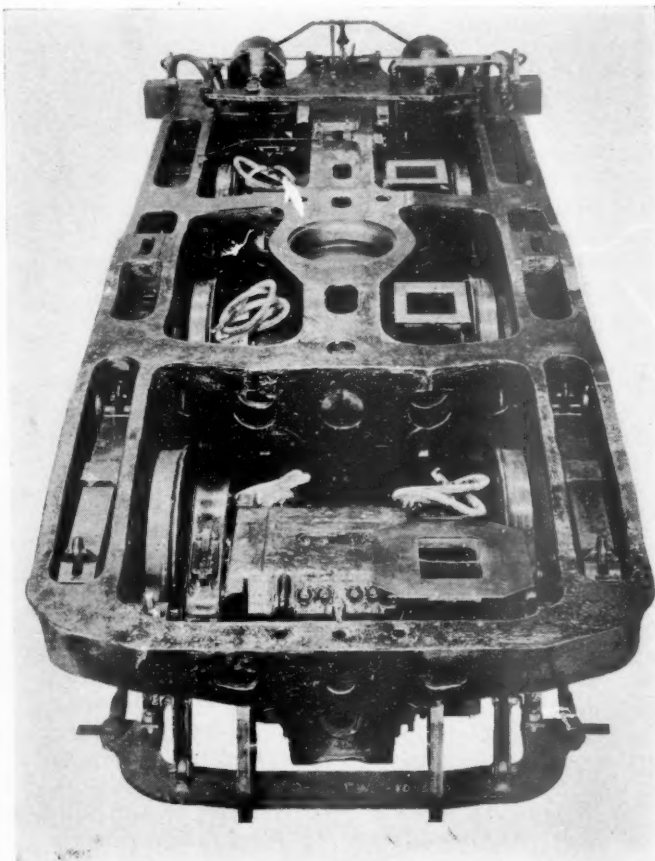
Auxiliary Equipment

The auxiliary generator providing 125 volts at all engine speeds, from idling to full speed, supplies power for the radiator-fan motors, traction-motor blower sets, air-brake compressors, lighting circuits, cab-heater motors, battery charging and excitation for the exciter.

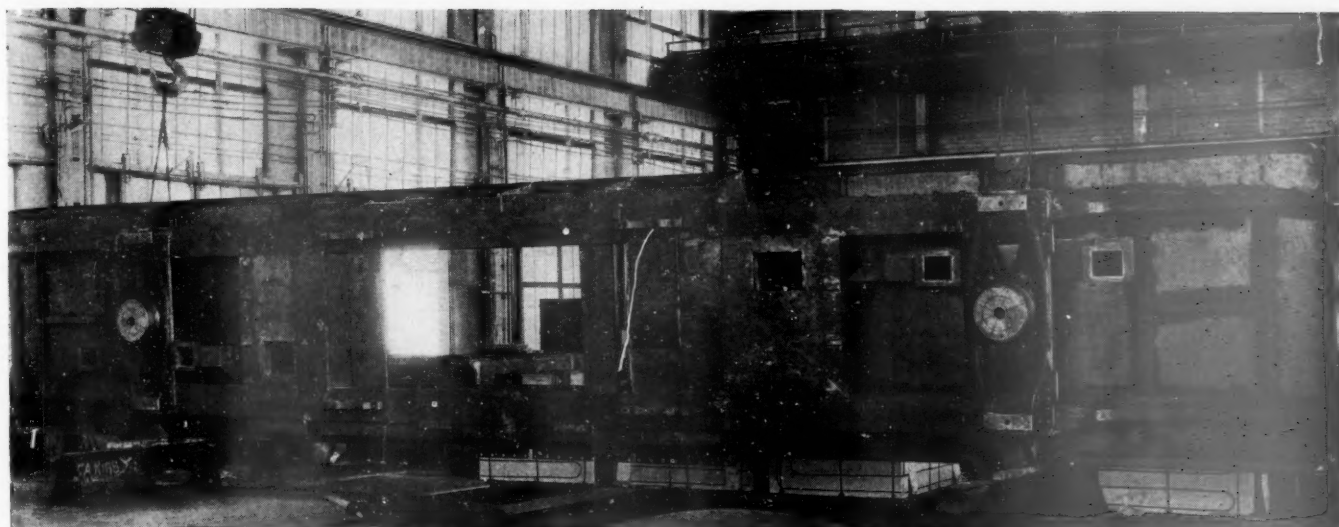
The equipment in the main cab, in addition to the generating sets, includes two traction-motor blower sets, one for each truck, and two air compressors with a piston displacement of 100 cu. ft. per min. each. Each of the blowers has capacity for providing a total of 4,500 cu. ft. of air per min. for the three motors which it supplies. The ventilating air is carried through a duct above the truck, which has a sliding connection above the air inlet to each motor. Underneath the cab is a 1,150-gal. fuel tank, the storage battery and the air reservoirs.

At each of the operating positions there is a throttle, master controller, gages, instruments, switch panels for the various auxiliaries and the usual air-brake equipment.

The cooling system consists of a three-sided radiator



Top View of the Six-Wheel Truck Showing the Traction Motors, Spring Arrangement and Brake Equipment



The Underframe during Construction

mounted in front of each operator's position, with a vertically mounted motor-driven propeller-type fan for exhausting the air upward from the radiator compartment. The fan motor in each radiator compartment is capable of exhausting 50,000 cu. ft. of air per min. A feature of this equipment is the provision for circulating the water in the two radiators in series, thus equalizing the water temperature in the two engines. One of the three sides of the radiator compartment is used for cooling the engine lubricating oil, each engine being provided with a separate oil-cooling system.

A cab-heating radiator in each operating cab, consisting of a fin-tube, air-blast unit, is connected to the

main water-circulating system. A small motor-driven fan circulates the air through this radiator.

The locomotive was built, equipped and tested, for the Ingersoll-Rand Company at the Erie Works of the General Electric Company.

Freight Car Loading

WASHINGTON, D. C.

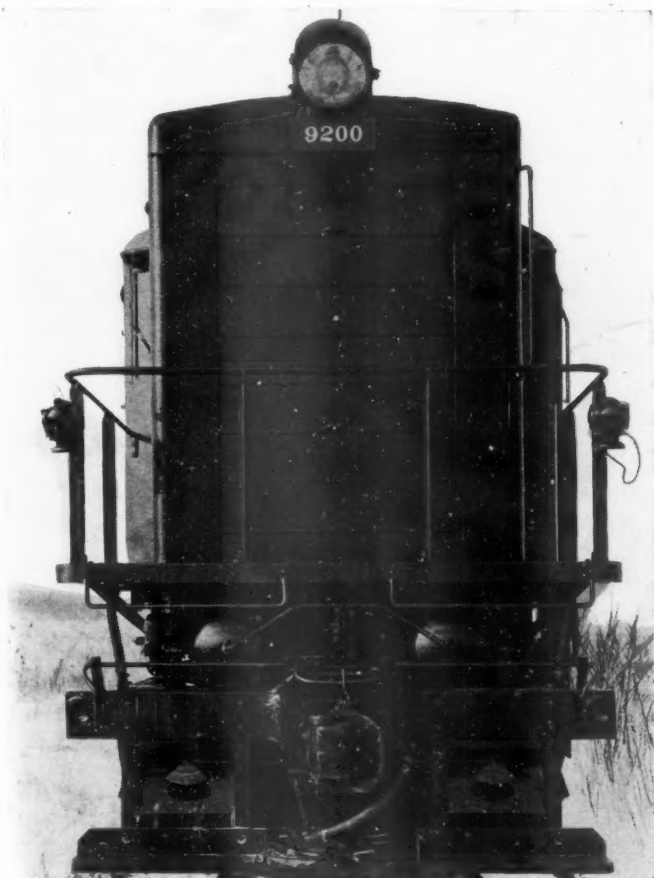
REVENUE freight car loading in the week ended April 4 totaled 613,867 cars, an increase of 13,380 cars as compared with the week before and an increase of 68,411 cars, or 12.5 per cent, as compared with the corresponding week of last year. All commodity classifications, except live stock and forest products showed increases as compared with the week before and all except merchandise, ore and live stock showed increases over last year's figures. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading For Week Ended Saturday, April 4

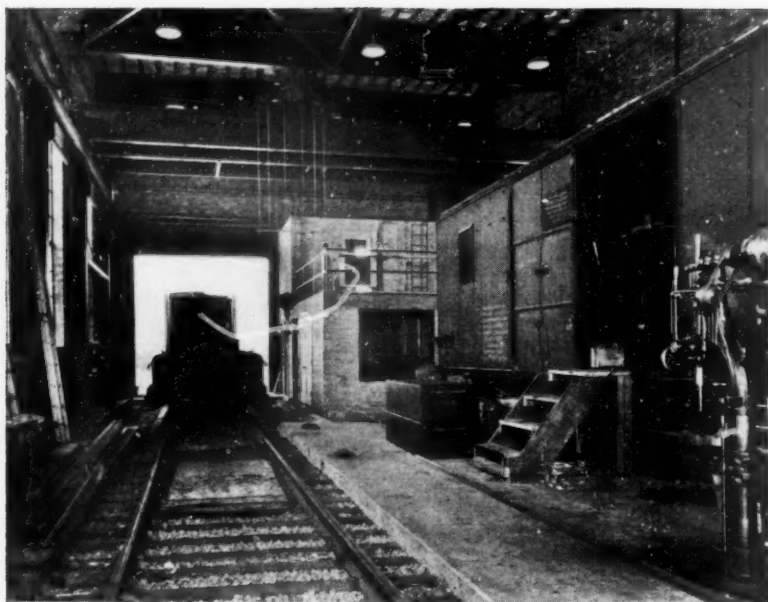
Districts	1936	1935	1934
Eastern	140,101	129,943	131,023
Allegheny	122,841	106,439	111,062
Pocahontas	40,364	29,927	37,608
Southern	96,364	84,964	90,180
Northwestern	71,595	67,201	64,645
Central Western	90,016	82,223	78,651
Southwestern	52,586	44,759	45,901
Total Western Districts.....	214,197	194,183	189,197
Total All Roads.....	613,867	545,456	559,070
Commodities			
Grain and Grain Products.....	29,968	25,604	25,921
Live Stock	11,557	12,396	13,050
Coal	98,994	69,226	89,826
Coke	6,541	5,329	5,937
Forest Products	28,589	24,353	23,595
Ore	5,953	6,032	5,089
Merchandise L.C.L.	162,612	162,701	167,094
Miscellaneous	269,653	239,815	228,558
April 4	613,867	545,456	559,070
March 28	600,487	616,520	610,190
March 21	566,808	607,178	610,036
March 14	616,862	597,431	627,549
March 7	634,828	587,190	614,120
Cumulative Total, 14 Weeks.....	8,521,081	8,050,374	8,124,238

Car Loading in Canada

Car loadings of the Canadian railways during the week ended April 4 totaled 44,345, according to the
(Continued on page 661)



End View of the Locomotive Showing the Cab and Truck Arrangement



Interior Master Scale Depot, Clearing, Ill., Bureau of Standards

Scale-Testing Activities Increase

Itineraries of Bureau of Standards equipment in 1935 included 13 master scales, 1,240 track scales, 26 scale cars and 55 standardizations

INCREASED activity in the testing of track scales and in standardizing scale-test cars is indicated in the report issued by the Bureau of Standards on its track-scale testing service for the fiscal year ending June 30, 1935. During this year 13 of the 19 master track scales in the United States were calibrated, 55 standardizations were made on scale-test cars and 1,240 track scales were tested on 123 roads in 38 states and the District of Columbia. Of the scales tested, 77.7 per cent were within the standard of accuracy which has been established for weighing on track scales. This compares with 33 per cent that met this standard in 1914, when the scale-testing service was started. It is also of interest that these scales had a mean percentage of error of only 0.19 per cent, which compares with a mean error of 0.65 per cent in the earlier year.

Since the scale-testing service was established in 1914, the Bureau has made 15,549 scale tests, an average of 707 a year. The number tested, 1,240, in 1935, is the largest for any year except 1934, in which year 1,309 scales were tested. Since there are more than 8,000 track scales in the United States, manifestly the Bureau can test only a relatively small percentage of them in any one year. This indicates the reason why the master scales are so important in the plan for maintaining accuracy of weighing. The following is abstracted from the report.

Many Scales Tested for First Time

To insure the greatest service in scale testing, the itineraries for the three testing outfits operated by the Bureau were prepared with the view of testing scales which had not received this attention recently. As a result, 20.6 per cent of all of the railway-owned scales tested during the year had not been tested previously by the Bureau; 14.3 per cent had not been tested within the last 10 years; and 14.1 per cent had been tested from 5 to 9 years previously. The remainder, 51 per cent, had been tested by the Bureau within 5 years. Of the industrial scales, 48.7 per cent had not been tested previously, 10.4 per cent had not been tested within 5 years, and 40.9 per cent had received tests within 5 years. As a result of this routing of the Bureau's test cars, it became impracticable to calibrate more than 13

of the 19 master scales in the United States during the year. Because of the importance of doing this annually, however, arrangements were made to check the remaining six scales as soon after July 1 as was feasible.

Substantially the same percentage of the scales tested were found to be weighing correctly as in 1934, the percentage for that year being 77.9, but this latter figure was a decrease of 2.7 per cent from the 1933 peak of 80.6 per cent. Railway track scales made a relatively better showing with respect to accuracy than those owned by industries, the figures being 80.6 per cent and 74 per cent, respectively, of those tested. As a whole, the Western district (corresponding to the I.C.C. designation) ranked much higher than either the Eastern or the Southern district, 86.2 per cent of the scales in this district having weighed correctly, as compared with 70.8 per cent in the Eastern district and 70.5 per cent in the Southern district. Likewise, the Western district led easily with the smallest mean numerical error, 0.15 per cent. The corresponding figure for the Southern district was 0.20 per cent and for the Eastern district 0.23 per cent, the latter representing a serious loss of accuracy, as compared with 1934, amounting to 0.11 per cent.

Testing a Master Scale

In general, the test of a master scale comprises three separate tests. The first is a preliminary maintenance test made for the purpose of ascertaining to what degree of accuracy exhibited during the last preceding calibration has been maintained. Indicating the precision with which these scales are expected to weigh, the standard of performance requires that when this test is made, and before any adjustments have been made, the error in the weights obtained shall not be greater than 0.02 per cent, or 6.4 oz. per ton of applied load. Following this, an adjustment test is made to determine the accuracy attained after the scale has been adjusted or modified, provided the condition of the scales as found renders such a step advisable; otherwise, the maintenance test is made a part of the adjustment test. The tolerance applied on the adjustment test is half of that required of the scale on the original or maintenance test, being 0.01 per cent of the applied load,

or about $3\frac{1}{4}$ oz. per ton, equivalent to the weight of six tablespoons of water. Finally, a test is made of the counterpoise weights to determine whether they are accurate.

All of the master scales tested were found to be within the prescribed maintenance tolerance of 0.02 per cent. In 10 of them the error was less than the adjustment tolerance of 0.01 per cent. However, adjustments or other modifications were made to seven of the master scales, to reduce weighing errors or to effect other improvements in their weighing performance. The numerical mean of the maximum per cent of error on the final tests of all of the scales tested was 0.006 per cent.

Table I—Summary of Railway Track Scale Test Data, Fiscal Year 1935

District and scale ownership	Number of scales tested	Within tolerance		Not within tolerance		Mean numerical error—per cent of applied load
		Number	Per cent	Number	Per cent	
Eastern						
Railroad	250	181	72.4	69	27.6	0.25
Industry	215	148	68.8	67	31.2	0.22*
Totals	465	329	70.8	136	29.2	0.23*
Southern						
Railroad	131	96	73.3	35	26.7	0.19
Industry	86	57	66.3	29	33.7	0.20
Totals	217	153	70.5	64	29.5	0.20
Western						
Railroad	309	279	90.3	30	9.7	0.11
Industry	249	202	81.1	47	18.9	0.20
Totals	558	481	86.2	77	13.8	0.15
All Districts						
Railroad	690	556	80.6	134	19.4	0.18
Industry	550	407	74.0	143	26.0	0.20*
Grand Totals	1240	963	77.7	277	22.3	0.19*
1934 Totals	1309	1020	77.9	289	22.1	0.17**

* Excluding one scale having abnormal error.

** Excluding two scales having abnormal errors.

The maximum per cent error usually occurred at the smaller loads, the mean figure being reduced to 0.003 per cent for loads greater than 60,000 lb. This error is equivalent to 0.96 oz. per ton of applied load, or slightly less than the weight of two tablespoons of water, and this on scales that are designed to weigh up to 150 tons.

Testing Track Scales

A test of a track scale consists essentially of determining the indications of the scale when standard test loads are placed in certain specified positions on the scale rails. The loads utilized for this purpose are 40,000 lb. and 80,000 lb. These observations are repeated for each position. One of the Bureau's testing outfits, however, also conducts a test with a distributed load of 120,000 lb. In addition, the sensitiveness of the scale and the performance with respect to zero balance are also determined. Following the test, a thorough inspection of the scale parts is made. When it is found that the character of error and the condition of the scale parts justify an adjustment, this may be made to improve the accuracy of weighing.

Railway track scales are considered to be correct or incorrect, depending on whether they are within the tolerance adopted by the Bureau. Substantially, it is required that the maximum indicated per cent of error of weighing, when computed in accordance with the methods detailed on the reverse of the forms upon which a report of each test is made to the owner, shall not exceed 0.2 per cent, for all scales except those employed in grain-weighing service, for which the error must not exceed 0.1 per cent, equivalent to 4 lb. and 2 lb., per ton respectively. Table 1 is a summary by districts of the results of the tests made on track scales during 1935.

In this table the scales are listed as being within or not within tolerance on the basis of a tolerance of 0.2 per cent, including 122 scales that are employed in grain-weighing service. Table 2 gives an analysis of the errors found in scales which were weighing incorrectly.

It was found that of the 690 railway-owned scales which were tested, 23.5 per cent were within one-fourth of the tolerance allowed and 50.8 per cent were within one-half of this tolerance. This record is not so good as that of 1934. In fact, every district shows a falling off, but the most serious decline was in the Eastern district. The scales owned by industries made a relatively poorer showing with respect to error distribution, as compared with railway-owned scales. However, except in the Eastern district, the figures for industry scales for the country as a whole and for the remaining districts individually did not differ materially from those of 1934.

There was a decided increase in the percentage of railway-owned scales having large errors, this tendency being most pronounced in the Eastern and Southern districts. In the former, 8.8 per cent, and in the latter, 5.3 per cent, of these scales tested had errors of more

Table II—Analysis of Errors of Incorrect Scales, Fiscal Year 1935

District and scale ownership	Total Number of incorrect scales	Mean numerical error—per cent of applied load	Errors in excess (+)		errors in deficiency (-)		
			Number of incorrect scales	Per cent of incorrect scales	Mean error—per cent of applied load	Number of incorrect scales	Per cent of incorrect scales
Eastern							
Railroad ..	69	0.59	41	59.4	0.39	28	40.6
Industry ..	67	0.46*	29	43.3	0.35	38	56.7
Totals ..	136	0.53*	70	51.5	0.37	66	48.5
Southern							
Railroad ..	35	0.43	16	45.7	0.33	19	54.3
Industry ..	29	0.38	16	55.2	0.35	13	44.8
Totals ..	64	0.41	32	50.0	0.34	32	50.0
Western							
Railroad ..	30	0.35	17	56.7	0.31	13	43.3
Industry ..	47	0.63	19	40.4	0.35	28	59.6
Totals ..	77	0.52	36	46.8	0.34	41	53.2
All Districts							
Railroad ..	134	0.50	74	55.2	0.36	60	44.8
Industry ..	143	0.50*	64	44.8	0.35	79	55.2
Grand Totals	277	0.50*	138	49.8	0.36	139	50.2
1934 Totals..	289	0.45**	137	47.4	0.36	152	52.6

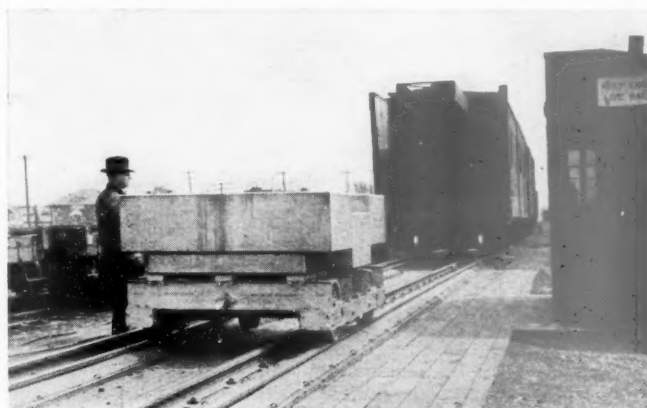
* Excluding one scale having abnormal error.

** Excluding two scales having abnormal errors.

than 0.5 per cent, or in excess of 10 lb. per ton of applied load. On the other hand, the industry-owned scales had a smaller number in this range than in 1934.

In contrast, it is significant that in the Western district, 66 per cent of the railway-owned scales and 55.9 per cent of the industry-owned scales tested were within one-half of the required tolerance.

As has been mentioned, 122 of the scales included



Test of a Railway Track Scale

in Table 1 are employed in grain-weighing service, a special tolerance of 0.1 per cent being required for this service. Of these 122 scales, 72.1 per cent were found to be accurate, as compared with 57.3 per cent in 1934, while the highest previous percentage for scales of this class was 63.9 in 1932. The mean numerical error of those not below the tolerance limit was 0.12 per cent, which equals the smallest mean error of record, in 1931.

At Clearing, Ill., the Bureau maintains a master scale depot which was open for service throughout the year. Fifty-five standardizations of scale-test cars were made during the year at this point. Of the cars tested, 30 belonged to 17 owners, two of which were standardized for the first time. Of the total, 23 cars were heavier and 30 were lighter than their nominal weights, while two were found to correspond with their nominal weights. Thirty-two of the cars which had been standardized previously by the Bureau had been repaired or

and 5 were correct within the limits of the accuracy attainable by field weighing. The average error of the heavy cars was 35 lb. and of the light cars 45 lb.

Accompanying the report were two graphs which are reproduced, showing the results found year by year since the Bureau started its co-operative scale-testing service. One of these graphs shows the mean errors of the railway track scales and the other the percentages of these scales that were found to be within tolerance. This year the figures from which the graphs have been plotted have been recomputed to include scales owned by federal, state and local governments in the industrial scales, these scales having previously been carried as a separate class. In addition, scales with grossly excessive errors have been excluded to make the general conditions comparable.

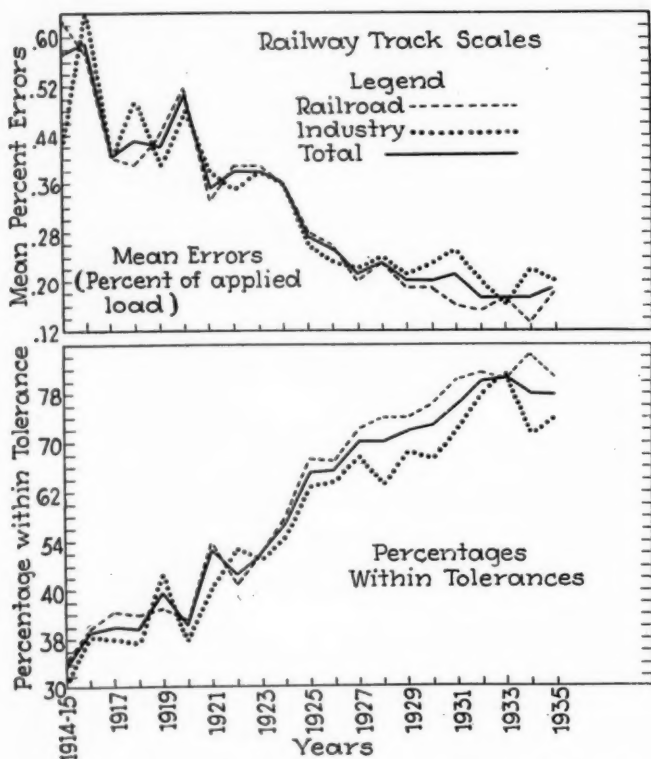


Diagram Showing Improvement in Accurate Weighing Since 1914

altered in some other way since the last standardization, leaving 21 for which there was no record of repairs or alteration since the last previous standardization. Of these, 7 were found to be heavy, 13 light and 1 correct. Eleven conformed essentially to the present specifications for test cars, while 10 departed from these specifications in important particulars of design and construction, which, it is believed by the Bureau, have a tendency to make the weight less reliable. Again, in general, it was found that as the intervals between standardizations increased the departure from the nominal weight increased, indicating the desirability of frequent standardization.

Many test cars are not standardized periodically on master scales, either because the territory in which they are operated is remote from such a facility or because the wheel base is too great to be accommodated on the master scale. For this reason the Bureau units are accustomed to weighing such cars in the field where track scales suitable for this purpose are available. During the year, 26 such cars were weighed, 4 of which were heavier and 17 lighter than their nominal weight

Rail Output in 1935 Was 711,537 Tons

THE production of steel rails in the United States in 1935 was 711,537 gross tons, according to a tabulation prepared by the American Iron & Steel Institute, New York. This represents a reduction of 29.5 per cent from the total of 1,010,224 tons in 1934, when production was stimulated by the PWA loans to the

Years	Under 50 pounds	50 and less than 85 pounds	85 and less than 100 pounds	100 and less than 120 pounds	120 and less than 136 pounds	136 pounds and over	Total
1920	489,043	433,333	952,622		729,118		2,604,116
1921	211,568	214,936	902,748		849,566		2,178,818
1922	265,541	274,731	728,604		902,900		2,171,776
1923	272,794	300,907	864,965		1,465,850		2,904,516
1924	191,046	213,274	853,431		1,175,581		2,433,332
1925	163,607	219,648	765,371		1,636,631		2,785,257
1926	197,260	256,287	797,662		1,966,440		3,217,649
1927	161,836	173,257	539,445	1,314,424	617,524		2,806,486
1928	134,197	125,726	465,393	1,203,749	718,428		2,647,493
1929	141,362	102,944	409,628	1,233,599	834,605		2,722,138
1930	95,626	81,299	267,879	335,496	592,933		1,873,233
1931	50,089	25,524	123,398	495,752	462,988		1,157,751
1932	16,655	13,705	28,593	215,091	128,522		402,566
1933	*49,116	†15,413	40,973	154,007	156,787		416,296
1934	*70,085	†17,111	73,639	491,642	325,942	31,805	1,010,224
1935	*57,127	†14,758	85,627	340,800	154,367	58,858	711,537

* 60 pounds or less per yard.

† Over 60 and less than 85 pounds per yard.

railways for rail purchases. However, the output was considerably larger than for either 1932 or 1933, when the corresponding totals were 402,566 tons and 416,296 tons, respectively.

A comparison of the production in 1934 and 1935 of rails of various weights per yard discloses reductions in all groups except "85 lb. and less than 100 lb." and "136 lb. and over," the most outstanding change being a decrease from 325,942 tons to 154,367 tons in rails weighing 120 lb. and less than 136 lb. The only pronounced increase was in the heaviest group—from 31,805 tons to 58,858 tons.

The total output of 711,537 tons included 684,661 tons of rails rolled from open-hearth ingots, 7,004 tons rolled from new open-hearth seconds, etc., 565 tons of Bessemer and electric steel and 19,307 tons rerolled from old rails. The open-hearth rails represent 97.21 per cent of the total, or exactly the same proportion as in 1934. Of the total tonnage, 25,940 tons embraced girder or high-tee rails and 520 tons of alloy steel rails. The figure for alloy steel rails is the smallest for any year except 1933 (437 tons) and compares with 12,909 tons in 1920.

The Future of Transportation*

Maintaining "existing opportunities" for employment by stifling economies not in public interest—More and better jobs seen in greater mechanization, passing savings on to consumers in lower prices

By Joseph B. Eastman

Federal Co-ordinator of Transportation

NO one can with any wisdom make plans concerning the transportation future, unless he keeps in mind the fact that scientific and engineering research will keep on functioning with accelerating momentum and will produce more progress per annum in the future than it has in the past. Right now there is pending in Congress a rather important bill which declares, among other things, that "it is in the public interest to maintain existing opportunities for employment." We shall all, I think, have no difficulty in agreeing that it is in the public interest to provide full opportunities for employment, so that no one who is able and willing to work will suffer for lack of a means of livelihood. It is a great blot on our civilization that we have so often failed lamentably in this respect. As yet we have not found the right answer to the problem, but it is, I think, reasonably certain that we shall not find it in any program which would stifle progress by putting an end to labor-saving improvements and maintaining unchanged the opportunities for employment which now exist.

How many people would be driving their own automobiles, if Henry Ford had followed such a program, and how many people would the automotive industry be employing in comparison with the great numbers which are now on its payrolls? I make no claim to be a profound student of the employment problem, but I cannot help feeling that there is a lesson which we may well heed in what the automobile builders have accomplished within a short space of time in furnishing means of livelihood to a large section of our population. It seems a reasonable conclusion that if the growing mechanization of industry and the widespread introduction of labor-saving devices and methods can be utilized, as was done with the automobile, to reduce the prices of products and bring them within the range of a great consuming public, what now appears a menace may be converted into a blessing.

Lower Prices Bring Wider Market

This principle applies to transportation quite as much as to any other industry. There is no fixed amount of transportation to be performed. It expands rapidly as facilities are brought within the means of those who are potentially capable of using them. Certainly this is true of passenger traffic, as is amply proved by the tremendous increase in the travel habit of the American people for which the automobile is responsible. It may not seem so clear when it comes to the transportation of property, but if one stops to think of the extent to which transportation of raw material, fuel, semi-processed goods, and finished product is a factor in the prices of most commodities, it is not difficult to understand how great a part it plays in marketability and in the power of the people to consume.

The railroads have been of wonderful service to the

country in this very way. If it were not for what they have done, for example, the orange and the banana would still be luxuries and enjoyment of the oyster and the lobster would be confined to the seaboard territory. These are only trivial illustrations of what they have made possible in the interchange of products and the development of industry. Yet it may well be that in the past 25 years the railroads have given rather too much thought to the immediate apparent advantages of increases in their rates and charges, and too little thought to the greater and less ephemeral advantages which would flow from bringing their facilities, through reductions in cost and improvements in service, within a wider range of public use.

Certainly there can be little question but that for the future the railroads must turn their thought in the latter direction. In the transportation of persons they no longer hold first rank, and while they are still by far the greatest agency in the transportation of property, even in that field they are no longer monarchs of all they survey.

Progress in Co-ordination "Nothing to Brag About"

Nearly three years ago I was given an unusual job, which goes by the name of Federal Co-ordinator of Transportation. One large part of that job was to help the railroads reduce their costs through greater co-operation with each other and co-ordination of the use of various of their facilities. Because of the terms of the statute and other reasons, which I shall not take time here to go into, the progress along these lines which has since been made has been nothing to brag about. Nevertheless we have explored much of the ground quite thoroughly and have also gone rather deeply into the opportunities for adjusting and improving operation, equipment, service, and rates to meet the needs of the transportation conditions of the present day. The conclusions which we have reached and the recommendations which we have made as a result of these inquiries have not been received with any great enthusiasm by the railroad executives or the railroad employees. And yet I entertain no doubt whatever that they have already had a good effect and that ultimately, not all, but a very large part, of these recommendations will, in one form or another, bear fruit.

Much Waste and Unnecessary Expense

No one, I think, questions that a large amount of waste and unnecessary expense is present in railroad operation, owing to the fact that the railroad system of the nation is in the hands of many separate and independent companies. The railroad industry can no longer afford this lost motion, and therefore will in due time do away with it. If this is not accomplished by the practice of co-operation and co-ordination, it will be done by actual consolidation of properties. The policy of co-operation and co-ordination is, in my judgment, the wiser one to

* From an address before the Engineers' Club of the Lehigh Valley, at Bethlehem, Pa., April 13, 1936.

follow, because it need not precipitate the disturbance and turmoil which an attempt to force the railroads into a very few gigantic systems would stir up; it would be confined to matters in which the interests of the companies are not really divergent, and leave them free to compete for traffic; and it would not run the risk of depriving them of the benefits which often flow from managements able, because the job is not too big, to give close personal attention to the properties and the needs of the communities which they serve.

A Picture of the Future

Giving you a picture in broad strokes of some of the things that are coming, if I am at all right about it, I can see **a central scientific, engineering, and economic research department** acting for all the railroads, able to establish within proper limits standards for equipment, construction, materials, and supplies, not too rigid or difficult to change, but which will prevent the great and unnecessary diversity of types which now adds heavily to costs. This department would also, as similar departments in other great industries have been able to do, keep the railroads not only abreast but ahead of the times, produce inventions as it were to order, and furnish the means of testing new and promising developments at common expense.

I can see many of the **freight cars handled in a common pool** so that they can be utilized with much less waste motion, just as the Pullman cars and to some extent the refrigerator cars are at the present time, and so that purchases of new equipment may be financed to maximum advantage and made in the orderly manner and at the appropriate times which will reduce manufacturing costs.

I can see the very complex and costly methods which now prevail in the handling of intercompany transactions, such as the dividing of joint rates, simplified and expedited by the **establishment of a central clearing house**.

In the larger places, served by two or more railroads, I can see the present confused, costly, and time-consuming terminal operations greatly simplified and reduced in volume and expense by **unified utilization of terminal facilities**.

I can see **joint use of some shops**, where conditions favor it, and a gradual raising of shop equipment and methods up to the high standards which now prevail on some of the railroads, but by no means all; and I can see similar progress in the handling of materials and supplies and the disposition of scrap and waste material.

When it comes to passenger service, the very marked advance which is being made in the air-conditioning of coaches and in their seating and other accommodations will be followed up by many other steps which will add to the comfort and convenience of the service. Attention will be concentrated to a much greater extent than heretofore on the customer and what he needs and wants. To provide service of greater frequency and flexibility, **single-unit passenger cars** propelled at low cost by gas or Diesel power with some form of mechanical or hydraulic or electric transmission will in many cases be employed, and they will be adapted to multiple-unit operation. To achieve light weight, new metals and methods of construction will be used. Passengers will be given collection and delivery service to and from stations. **Advertising and other means of marketing the service will be improved and developed**, and often employed by the railroads collectively. Station accommodations and service will be made more convenient and attractive. **The trend of fares will be downward**. Busses will be used in many situations to

augment or supplement, and in co-ordination with, rail service.

In freight service, I can see the **less-than-carload, express, car-forwarder and less-than-carload traffic combined, concentrated, and handled in much more heavily-loaded cars of shock-proof construction**, moved at passenger-train speeds. The distribution at either end will be done by trucks, probably to and from railheads usually located outside of the crowded city areas. An intermediate service, between the present less-than-carload and carload services, will be developed by the use of containers carried on flat cars. They will be of lightweight construction, of uniform types, and capable of interchange between all railroads, and between railroads and motor trucks or water carriers. Some of them will be adapted to special services, including refrigeration.

In freight service generally, the tendency will be towards **faster and more frequent operation of trains**, although heavy tonnage trains will continue to have their place. Steps will be taken to reduce the heavy costs and delays which now characterize terminal operations, these steps including not only unified use of various facilities, but a **more extensive use of motor trucks**. These will also be used to a greater extent in substitution for local way-freight and branch-line operations, although there will be a development for rail use of **lightweight motive-power units** having a similar purpose. The unification of terminal facilities and the greater use of trucks in such service will probably release from railroad use, in due course, considerable land in crowded city areas which can be sold with profit.

In many situations where unnecessary duplicate or multiple operations are now conducted, in both the freight and the passenger services, there will be a **pooling of operations**; but instead of depriving the public of accommodations, the tendency in such arrangements will be to give a better balanced and more convenient service.

I can see a gradual revision of the freight-rate structure. The tendency will be toward **simplification of rates and a closer relation to cost of service**. This will be forced by the competition of the other forms of transportation, including private carriage. Cost-finding systems will be introduced or expanded for use on the railroads, not only in connection with rates, but also to obtain a closer check on expenditures. The general **tendency of rates will be downward**. When such adjustments in rates as can be justified are made and railroad service becomes as efficient and economical as is possible, I now see **little future for long-haul motor-truck haulage** of most commodities, although I expect to see the shorter-haul operations expand continually.

Others will have a different picture. No one can be sure of anything, except that there will be many and important changes, and that some of these will not be foreseen at all.

Labor Entitled to Reasonable Protection

At present the railroad employees fear and oppose any changes which will have the immediate effect of displacing labor. I can understand and sympathize with their fears. Many now realize, and in due time I feel sure that most of the employees will come to realize, what the railroads must do to meet the needs of the present and the future, and that the path to a live and thriving railroad industry which can provide more employment opportunities runs in the direction of better service at lower costs. They are entitled to reasonable protection against hardships which large-scale economy projects would impose by displacements without oppor-

tunity for other employment. The managements and the men have been negotiating in regard to this matter and I very much hope that they may be brought into agreement, or that the necessary protection can be provided through reasonable and practicable legislation.

Refinancing Won't Remove Need for Economy

Some have the idea, I think, that a sufficient remedy for railroad troubles can be found in a reduction of their indebtedness and fixed charges. There are now 88 steam railroad companies in receivership or bankruptcy, operating 69,008 miles of road, or about 27 per cent of the total. Railroad credit can be helped materially by a financial reorganization along sound lines of these bankrupt railroads, and of others which may meet with similar difficulties. But it is a mistake to assume that any such process, however far it may be carried, can remove the need for the utmost economy and efficiency in railroad operation. Neither the passenger nor the merchandise traffic nor a large part of the carload freight traffic has for some years been paying its share of operating expenses. Moreover, whatever allowance may be made for past financial exploitation and for obsolescence and other forms of depreciation, there remains a great investment in railroad property which is entitled under the law to a fair return and on which in the long run a return must be earned, if the industry is to be conducted successfully under private enterprise and capital, or indeed under any system of public ownership which will not burden the taxpayers of the country.

The railroad executives are naturally slow to inaugurate any radical changes in operation, equipment, service, or rates. In the final analysis, they must bear the responsibility, and from experience they know how long it takes to be sure that experiments rest on a really sound basis. They also find it difficult to agree with each other in many situations where collective action is at stake. A further obstacle to improvements lies in the financial troubles of the railroads. For these reasons progress will often be slower than many of us would like it to be, but I have much confidence that in the end it will come. Evidences of new trends of thought are rapidly making their appearance among the executives.

The Government's Part

The government also has obligations and duties with respect to transportation. I have talked to you mostly about railroads, but the government can, of course, play no favorites in its dealings with the various forms of transportation. If an entirely new kind should suddenly develop, superior to and able to play havoc with them all, under no theory of sound administration of public affairs could it be suppressed or deprived of an opportunity to furnish its new and better service.

The function of the government in transportation is not to set limits to initiative and enterprise, but to prevent the rise of abuses which may impair the health and well-being of the transportation agencies or inflict injury on the public, such abuses including financial exploitation, unfair or destructive competition, unjust discrimination in rates or service, exorbitant charges, or disregard of the public safety. The duty of the government, in other words, is to preserve good order, promote stability and conditions favorable to healthy growth, and hold the scales even between all the rival carriers.

In my work as Federal Co-ordinator of Transportation, this is the kind of comprehensive public regulation of transportation that I have been trying to further, and we are, I believe, making good progress in that direction.

Wheeler-Crosser Bill Before Senate Committee

WASHINGTON, D. C.

DISCUSSION of the Wheeler-Crosser bill, proposed by the railroad labor organizations as a substitute for the labor restrictions of the emergency transportation act and to provide for the payment of two-thirds wages to employees displaced by the consolidation, co-ordination, pooling, or abandonment of railroad facilities, was transferred this week to the Senate committee on interstate commerce, which began hearings on the bill on April 13 with George M. Harrison, chairman of the Railway Labor Executives' Association, as the first witness. Mr. Harrison was followed by J. J. Pelley, president of the Association of American Railroads, in opposition to the bill, and Chairman Wheeler of the committee announced that Co-ordinator Eastman would be asked later to express his views on the bill.

Senators Think Provisions Too Broad

Mr. Harrison's statement was largely a repetition of that he had given at the hearing before a sub-committee of the House committee on interstate and foreign commerce. He also repeated his denial that the proponents of the bill had intended it to be subject to the interpretations placed by railroad witnesses on certain provisions of the bill on which they had concentrated their main objections and expressed a willingness to have it amended if necessary to confine it to the original intention. Later, when Mr. Pelley repeated his objections, saying he was discussing the bill as written, rather than as described by Mr. Harrison, both Senator Wheeler and Senator Couzens expressed the opinion that the provisions of the bill as drawn are too broad.

Mr. Harrison said it was not contemplated that the bill should restrict the railroads in adjusting their service to the demands of the public but that it was the intention to protect employees affected when railroads merge, pool, consolidate or co-ordinate their facilities by requiring the railroads to "share" the economies with the employees. "We are not here proposing that a carrier be restricted in carrying on its normal operations," he said, "and if there is anything in the bill contrary to that we will be glad to have it amended."

Mr. Pelley said that as written the bill would clearly give the Interstate Commerce Commission control over almost every act of a railroad, taken independently or with others, that resulted in reduction of employment. "I think the committee would not agree with that," said Senator Couzens. "It is generally admitted that that provision should not exist and I think your objections are valid." Senator Wheeler also said he thought that provision too broad. He also said that he thought there ought to be an agreement between the railroads and the labor organizations on the subject of the bill but that if the emergency transportation act is not passed again the railroad employees have a right to fear what may happen to them and that if there is not agreement he felt that Congress should take some action before adjournment.

Meanwhile the committees representing the railroads and the labor organizations that have been conferring intermittently for several weeks in an effort to reach an agreement on a plan of dismissal compensation have been awaiting some word calling them to the White House for a further discussion with the President, who had urged them to try to settle the problem by negotiation.

rather than by legislation but had also given his approval to consideration of the bill in Congress. The President was advised that the negotiations between the committees were terminated on April 9 without result. Mr. Harrison told the committee that the railroads had apparently accepted the principle that the employees should be protected but that there was no agreement as to the extent to which it should be carried, and Mr. Pelley expressed the belief that the matter could be worked out in some way by agreement rather than by legislation.

Co-ordinator Eastman, whose announcement of his intention to issue orders requiring unification of railroad terminals in 11 cities had helped to precipitate the controversy, continued to withhold the proposed orders which he had postponed at the request of the President. Only two months now remain before the expiration of his term of office under the present law, on June 16, and there has been little indication so far that Congress intends to extend it again.

Mr. Harrison had a lengthy statement reviewing the history of the railroads since 1920 and emphasizing the large reduction in the number of railroad employees as between the peak left by the Railroad Administration and the low point reached during the depression. He also criticized the large capital expenditures made by the railroads, which he sometimes referred to as representing "expansion" unwarranted by the traffic and at other times as "technological progress" which increased the interest charges of the railroads and displaced employees, and he said that Congress had an obligation to protect the employees because it had written the policy of consolidation and co-ordination into the transportation act and the emergency act. He said it was proper to apply such legislation to the railroads because they are recognized as performing a public service but that in his opinion all workers affected by technological progress ought to be protected.

Senator Wheeler brought up the subject of railroad propaganda against the bill on April 14 by reading a letter from a clerk on the Erie, enclosing a mimeographed copy of a protest to members of Congress and a pamphlet on the bill issued by the Associated Railroads of New York, and stating that he had been warned by his chief clerk that he was liable to lose his job unless he circulated 50 copies of the petition. Mr. Harrison then said that R. V. Fletcher, general counsel of the Association of American Railroads, had written a letter of instructions to railroad representatives and "contact men" calling on them to "get busy" with their friends, clubs, etc., and have them telegraph or write to members of Congress in opposition to the bill. He quoted Mr. Fletcher as saying that speed was necessary to prevent the legislation and that the House sub-committee in charge of the bill, of five members, included three who were friendly to labor and hostile to the railroads. On some railroads, Mr. Harrison said, petitions were prepared and employees were asked to sign them and send them to Congress, although most of the employees had no knowledge of what was in the bill. He said he did not think employees were directly threatened with loss of their jobs but that they were given to understand they had better sign if they did not want to incur the displeasure of the management. "Here we are trying to get legislation so their jobs will be secure and the railroads ask their employees to sign petitions saying they don't want it," he said, adding that the pamphlet misrepresented the purpose of the bill. Mr. Fletcher at this point asked if there was anything in his letter suggesting that employees be asked to oppose the bill and Mr. Harrison replied that he did not think there was.

Senator Wheeler remarked that "the railroads had

been so successful with their propaganda among the employees on the Pettengill bill that they thought they would try it with this bill."

Mr. Harrison argued that the railroads were being asked merely to share with labor the economies to be derived from co-ordination, saying that they would at once save about 20 per cent of the expense not attributable to labor and one-third of the wages of the men laid off, and that in about six years they would have the full saving as the men displaced took the places of men retired in normal ways. He said the bill provides for the payment of two-thirds wages until the men displaced are returned to service, except that if they fail to respond to a call to return they would lose the benefit and that an employee might accept one full year's wages and terminate his rights. In reply to a question he said that no provision had been made in the bill to cover the event of a man obtaining employment elsewhere, because it was not anticipated that there would be much opportunity for such employment, but Senator Wheeler said he thought there ought to be a provision that a man could not still draw his two-thirds pay if he obtained employment elsewhere and Mr. Harrison agreed.

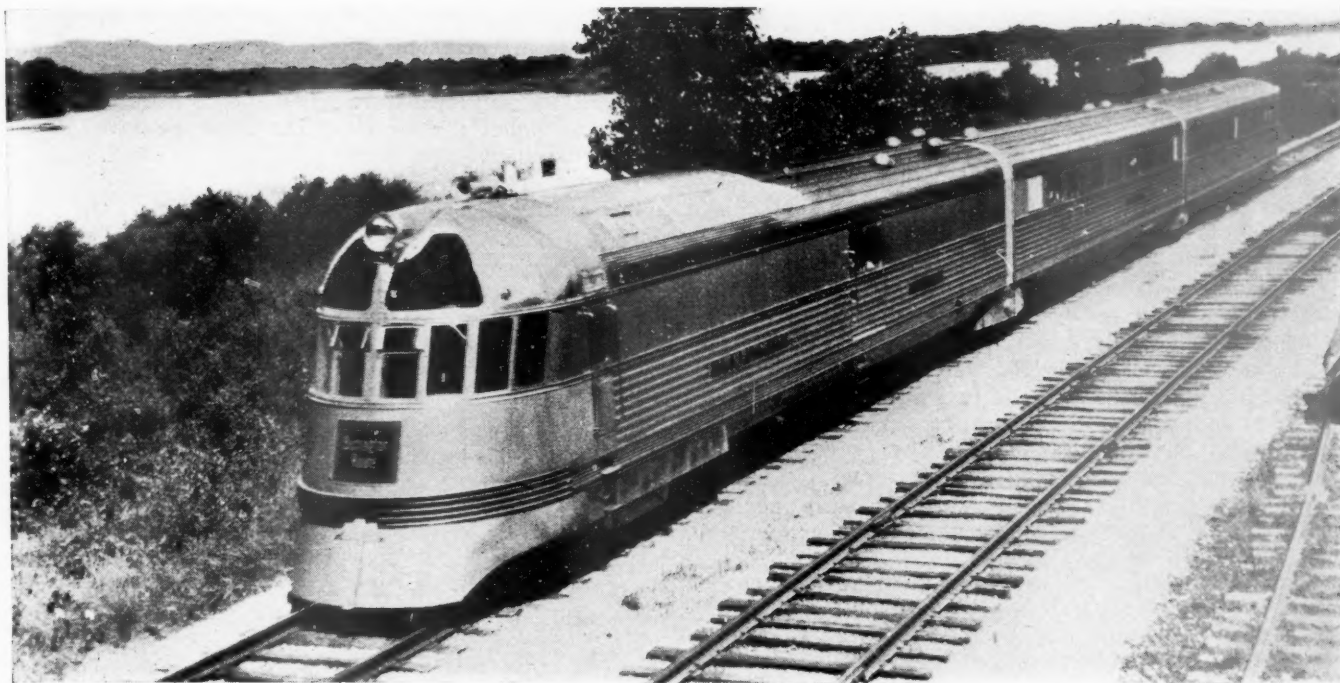
Mr. Harrison said that a few railroads had already accepted the principle that employees laid off as a result of co-ordination projects should be compensated but that many more such projects are now pending and unless some legislation is passed those which the carriers desire to put into effect will be adopted after June 16 and the employees will lose their jobs. He said he was merely proposing to apply to human beings the principle the railroads apply to materials and that if they retire a million dollars' worth of property they continue to pay interest on the bonds.

Senator Couzens inquired about the conferences between the railroad and labor committees and asked if the principles of the bill had been agreed upon. Mr. Harrison replied that he was not at liberty to discuss the exchange of propositions that had been made and that it had been agreed that if the conference failed it should not prejudice the employees in their efforts to find a solution in legislation but that he thought there was an admission on the part of the railroads that something ought to be done about this although they were not able to agree on the extent. Mr. Fletcher at this point said that the railroads took no exception to that statement.

In taking up the bill section by section Mr. Harrison said that the Interstate Commerce Commission already has jurisdiction over consolidations of two or more railroads but that the bill goes farther and gives it jurisdiction over a merger of facilities such as offices or shops by one railroad. Senator Wheeler said he desired to have the railroads also go over the bill section by section and told Mr. Fletcher that if he felt it is unconstitutional he wished he would point out wherein he thought so. Mr. Fletcher said he had not expected to argue the constitutional question.

Mr. Pelley, in his statement, said that since the railroad business is not constant, if this bill became a law a railroad could not readjust its service without going to the commission, and that it would put the railroads at a further disadvantage as compared with their competitors. "So far as it applies to two or more carriers," he said, "we think that the rights of the men should be settled by agreement rather than by legislation. We think there should be no legislation to prevent railroads from making any economies they can either jointly or individually. There are several cases in which agreements have been made already. We think that is the orderly way." When Senator Wheeler asked if the railroad executives gen-

(Continued on page 662)



A Million Miles of Zephyr Operations Have Provided Much Data for Study

A Million Miles of New Railway Travel*

Lessons from the experience of the Burlington with
light-weight Diesel-powered trains

By Ralph Budd

President, Chicago, Burlington & Quincy

It is expected that the total mileage of the four Zephyrs on the Burlington will reach the million mark by April 30, 1936. While still not very great when compared with total American passenger train mileage, nevertheless this record is sufficient to use for intelligent analysis, and serves the purpose of pointing to certain trends and conclusions that can be based only on experience.

On-Time Record

A number of pertinent questions have been asked regarding the Zephyrs, some with an engineering bearing, some with a popular flavor. Some of these questions can be answered positively, others by their very nature are indeterminate.

How fast do the Zephyrs run? The Twin City Zephyrs run 90 to 95 m.p.h. on some parts of practically every trip. The average speed for 431 miles between Chicago and St. Paul, Minn., including six stops, is 66.3 m.p.h. When the station stops are short and the trains, therefore, are able to depart practically on time, the maximum speed necessary to make the schedule is

80 m.p.h., except for a few miles between Chicago and Aurora, Ill., where it is 85 m.p.h. The objective of the operating officers and the effort of the train crews is to hold the maximum speed as low as possible, that is, to have the fastest part of the run approximate, as nearly as possible, the average speed.

The Lincoln-Omaha-Kansas City Zephyr averages 60 m.p.h. between Lincoln, Neb., and Omaha, and 50 m.p.h., including 11 stops, between Omaha and Kansas City, Mo., 195 miles. The highest speed is approximately 80 m.p.h. for this train, and also for the Mark Twain Zephyr, which averages 40 m.p.h. on its 442-mile round trip, during which it makes 60 stops.

Are they usually on time? The four trains have made their schedules 94 per cent of the time. This compares with 60 per cent for other passenger trains on comparable runs. These other trains, however, have been no more than 30 min. late 90 per cent of the time. Each of the Twin Zephyrs between Chicago and the Twin Cities makes a round trip daily, leaving Chicago and Minneapolis, Minn., respectively, at 8 o'clock every morning and arriving back at the starting point at 10:59 p.m., after a round trip of 882 miles, during which they are turned on wye tracks located a half mile to a mile

* Abstracted from an article which appeared in Civil Engineering for April, 1936.

and a half from the stations, and cleaned and stocked with provisions for the return trip. For six weeks last winter they operated through extremely severe weather conditions. This is the second winter of eminently successful operation of the first Zephyr between Lincoln, Omaha and Kansas City. The fourth Zephyr, the Mark Twain, has performed almost perfectly since its inauguration.

No Structural Defects

Have they shown any defects or weaknesses? No structural weaknesses or defects of any kind have been disclosed upon continuous and careful inspection. Normal maintenance has been followed. For example, wheels have been changed and turned, pistons have been renewed and injectors have been replaced and somewhat improved. Structurally the cars have proved faultless. A fourth car has been added to the original Zephyr. It was built 16 months after the other three cars but in appearance the others seem just as new as does the later one.

The availability for service of the four trains has averaged 97 per cent. This high availability is attained by careful inspection and by replacing the parts that wear out on a definite schedule. On our modern high-speed passenger engines, experience has demonstrated the necessity of establishing a mileage limitation on main driver axles. We were of the opinion that this might be found desirable in connection with the motor axles of high-speed Diesel electrics, and we are making periodic examination of our motor-driven axles.

Accidents

Have they had any accidents? The four Zephyrs now operating regularly have had nine grade-crossing accidents. They have struck four automobiles, one truck and one road grader, and they have been run into by two automobiles and one truck. In the course of their million miles, they have run down a good many animals—cattle, horses and mules—on the track between crossings.

Data gathered during the 10-month period, April, 1935, to January, 1936, when most of the Zephyr mileage was made, indicate that the Zephyrs had somewhat fewer accidents per million train-miles than other passenger trains, but there was not much difference, the figures being 6.00 per million train-miles for the Zephyrs and 6.94 for all other passenger trains.

On March 1, 1936, one of them, the Mark Twain, had the first accident involving another train. Five minutes before the end of its trip, it collided with a string of Pullmans at a crossover in the yards outside of the St. Louis union station. Speed was reduced to 20 miles an hour at the time of the collision. One of the Pullmans was completely derailed, and the front trucks of the Zephyr also were derailed, but it sustained no damage beyond some scratches. None of its 61 passengers was injured and it made its regular run the next morning.

What happens when they strike, or are struck by, automobiles or trucks? The vehicles struck by Zephyr trains have been demolished or badly damaged. No damage has been done to the Zephyrs in any of the highway crossing accidents beyond scratching and denting the stainless steel covering, and the trains have always continued on their runs and made schedule time. While the trains as a whole are light in weight, the forward truck of each train carries more weight than does the forward truck of our largest passenger locomotives.

The shape of the front, as well as its construction, combine to make the train a veritable battering ram. The shovel-nose lower section and the rounded, sloping contour above, tend to lift obstacles and throw them

into the clear. The large, heavy and exceptionally strong front car frame, made of a welded alloy (chromansil), is also the engine bed. This gives a weight of 100,000 lb. on the forward truck and constitutes a steel-sheathed bullet for impact. The Zephyrs have proved to be excellent snow plows.

Revenues and Costs

Have they been well patronized? The patronage of the Zephyrs has exceeded expectations. Two of the trains—the first Zephyr between Lincoln, Omaha, and Kansas City, and the Mark Twain between Burlington, Iowa, and St. Louis, Mo.—have been increased to four cars each. Since the enlargement, the seating capacity, 112 and 92, respectively, has been insufficient on a number of occasions. The Twin Zephyrs have three cars each, accommodating 70 passengers, plus 16 seats in the dining section, and their capacity has been insufficient many times. During July and August, 1935, approximately 5,000 persons could not be accommodated.

How much does it cost to operate them? The cost of operation for 640,942 miles to December 31, 1935 (latest data available), was 31 cents per train-mile. This includes everything except depreciation and track maintenance and includes an accrual for power plant maintenance. It seems safe to say that the cost of operation is substantially less than half that for a conventional train of the same capacity at the same speeds. Actual costs for the Zephyrs and the best estimate for comparable steam trains are as follows:

	Zephyr Trains	Steam Trains
Maintenance of power plant or locomotive.....	\$0.0504	\$0.1830
Maintenance of train.....	0.0399	0.1020
Cost of fuel oil or coal.....	0.0139	0.1085
Cost of lubricating oil and water.....	0.0093	0.0140
Wages of crew.....	0.1735	0.2240
Train supplies and expenses.....	0.0271	0.0640
Total	\$0.3141	\$0.6955

Safety

Are they as safe as other trains? Experienced railway operating officers believe that stainless steel trains of this type are the safest trains that can be built for high-speed operation. They are strong, are free from noticeable vibration, have a low center of gravity, hold the rails remarkably well and are easy on track. Furthermore, the great strength of the material used provides maximum protection in the event of any accident, particularly if it should be accompanied by fire. Of course, the deceleration of high-speed trains is a major engineering problem. We know that the Zephyrs can be stopped in a much shorter distance than conventional trains running at the same speed.

Do they ride comfortably? It is difficult to get a direct comparison of the riding qualities of these trains with those of other trains because other trains seldom attain the speeds of the Zephyrs. Their articulated construction gives them certain marked advantages. There is no side motion at the couplings, and since the cars do not extend beyond the center of the articulated trucks, adjacent cars act in perfect unison. This feature, together with the low center of gravity, provides smooth and quiet performance at high speeds, especially on curves. The starting and stopping is without any jerking or bumping. The contour of all the wheels used in these high-speed trains, except the power truck wheels, has been modified so that they now have cylindrical treads instead of conical treads. These substitutions have brought about a great improvement in riding comfort. Because of the light axle loads (except

on the front truck) the life of wheels, even at high speeds, has been satisfactory. The average mileage between turnings has been as follows:

36-in. wheels (power truck)..... 58,844 miles
30-in. wheels (trailing trucks).... 56,490 miles

What of the Future?

Will they take the place of other trains? The extent and type of passenger train evolution is far from certain. There does not seem to be any doubt, however, that some additional trains will be replaced by relatively small light-weight streamlined trains. Perhaps some of our gas-electric cars can be so replaced, increasing patronage sufficiently to justify the expense. In other circumstances, they will take the place of small conventional-type trains and both stimulate travel and promote economy, thus bringing a good return on the investment. Each situation must be studied separately in order to make a reasonably sound decision. So much for the small three or four-car streamlined train, which is the only type that has run enough miles in actual service to afford any basis of experience.

The question also impels a consideration of larger streamlined Diesel trains. How much is reduction in weight worth? How much can weight be reduced without sacrificing strength or seriously shortening the life of the cars, owing to rust or corrosion? How important is it to lower the center of gravity? How advantageous is the articulated construction in attaining high speeds with greater comfort and safety? How serious a handicap is the inflexibility of this articulated construction in ordinary service? These are some of the questions that arise concerning the cars. They affect the choice of size and type of locomotive, and that choice otherwise is not simple, involving as it does a great variety of problems.

Articulation

The articulated cars and low center of gravity give added comfort and eliminate weight. In the case of small local trains where it is not imperative, or very important, to interchange cars with other trains, or to pick up or set out cars, the maximum of economy, comfort and capacity are obtainable by lightweight construction combined with Diesel power. But the capacity of such trains is limited and inflexible. For larger trains interchangeability of cars is a necessity. There are at least three ways by which that can be accomplished.

1. By building light-weight but otherwise standard cars which, depending upon the material used, will weigh as little as one-half what a conventional car weighs.

2. By building the cars as low as practicable but otherwise equipped with two trucks and couplings. Thus they are interchangeable with each other, but not with cars having couplers of standard height.

3. By combining interchangeability and articulation so that the cars will be partly articulated; that is, by building groups of two, three or four-car units that will be articulated, except that at the extreme ends of each group they would be equipped with trucks and couplers which would permit the two, three or four articulated car groups to be set out or picked up.

Partial articulation is being used in the two new light-weight stainless steel trains that are being built for the Burlington to operate between Chicago and Denver, Colo. Pairs of those cars will be interchangeable between the two trains but will not be interchangeable with cars having standard couplers, except that the forward

end of the first car in each train may be coupled to any standard piece of equipment. The reduction in weight accomplished in these trains is more than half.

No one knows how great an expenditure is justified to reduce the weight of high-speed passenger train cars. Equally significant is the fact that no one knows how much it would cost if a general program of building light-weight equipment should be undertaken. The trains that are now in service and those that will be placed in service shortly will provide the experience and the statistics upon which, later, more confident conclusions may be based. But all such trains that have been built have been of such special design and construction that none of the benefits that will come from mass production have as yet been realized.

Another unknown, but probably important, factor is the precise effect of heavy, compared with lighter, axle loads upon both track and wheels when trains are regularly operated at very high speeds. What needs to be done to prepare track for these speeds is fairly well known, but how much more it costs to keep the surface and alinement in the necessary condition of near perfection than to maintain it in condition for slower speeds is not known; nor is it known exactly how the tendency for rails to break may be influenced by the various types and weights of motive power and equipment.

Larger Units

Based on experience to date, the larger type of Diesel-powered train will be projected into a new field, that of overnight service, on very fast schedules. This does not infer that all the problems to be encountered in the enlarged field are identically like those which have been met, thus far successfully, in the small Zephyrs. But there do not seem to be any inherent difficulties, and it appears to be less of an adventure into the unknown to step from the present to the larger trains, than was represented by the launching of the first Zephyrs. Metallurgists deserve great credit for the possibilities that have been opened up to the railways in the way of light-weight equipment. They have given us metals far surpassing those with which we had dealt formerly, and the modern methods of fabricating these superior metals are as essential as the materials themselves.

The significance of these light-weight trains is not found in the comparatively small figures that they themselves represent, but in the idea that they symbolize, namely, the performing of work with a minimum of effort. This idea will be carried out to a greater or less extent in all future railway equipment, both passenger and freight, as well as in locomotives.

Freight Car Loading

(Continued from page 651)

compilation of the Dominion Bureau of Statistics. This was 172 above the total of the corresponding week in 1935, and 296 above the previous week this year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
April 4, 1936.....	44,345	25,287
March 28, 1936.....	44,049	25,303
March 21, 1936.....	44,059	22,263
April 6, 1935.....	44,173	23,920
Cumulative Totals for Canada:		
April 4, 1936.....	588,603	320,820
April 6, 1935.....	599,322	319,559
April 7, 1934.....	570,863	324,382

M. & St. L. Dismemberment Hearings

THE first of the hearings before the Interstate Commerce Commission on the proposal of the Associated Railways Company to take over the Minneapolis & St. Louis continued at Minneapolis, Minn., through this week. The second of the hearings is scheduled to open at Ft. Dodge, Iowa, on April 20. Testimony at Minneapolis, as reported in the *Railway Age* of April 11, was confined to evidence presented by Associated and the railroads participating in the organization of that company and was designed to prove the soundness of the plan and the manner in which the acquired lines would be utilized.

The Minneapolis hearing disclosed considerable opposition to dismemberment on the part of town residents along the line and employees. Charles E. Elmquist, counsel for the M. & St. L. defense committee, moved that the application of Associated be dismissed on the ground that no showing during early testimony was made to prove that the program would serve public convenience and necessity. The Illinois Commerce Commission, on April 9, intervened in the proceedings in opposition to the split-up, its counsel contending that at least three of the railroads are in no financial condition to take over the M. & St. L., and that dismemberment would reduce employment in Illinois.

An interesting angle of the case was introduced by Mansfield Ferry, counsel for the trustees of the mortgage on the Albert Lea-Minneapolis line, who testified that the holders of these bonds will probably foreclose the mortgage if Associated's plan is not approved. If the plan is approved, this mortgage will be paid in full, he said, and other bondholders and creditors will receive some consideration. If this mortgage is foreclosed and the railroad sold, he stated, it will have preference and other creditors will receive only the amount secured in excess of this mortgage.

George W. Hand, assistant to the president of the Chicago & North Western and president of Associated, testified for Associated, saying that the latter's plan is the only one that will permit the continued operation of any large part of the M. & St. L. and that the state of its earnings and properties will not enable it to continue long as an independent unit. He said that when abandonments were considered, the territory was studied and the importance of the various towns taken into account, with the result that portions of the railroad extending from these towns to the closest line of the participating carriers will be preserved and operated as branch lines of the railroads acquiring them. Mr. Hand stated that Associated sought to save as much of the railroad as possible and none of the co-operating railroads expects to make any substantial profit from the operation of its share.

On cross-examination, Mr. Hand answered the contention that most of the employees of the M. & St. L. would lose their jobs by saying that while no detailed plans had been made to take care of the employees, the six railroads would retain as many of them as possible and those dropped would be included in the list of workers first to be called if more employees were needed.

Associated completed its evidence on April 10, following which the six carriers participating in the plan started the presentation of testimony to show the part each railway will play in the proposition. The first of these was the Chicago, Burlington & Quincy which will take over the line from Tracy, Iowa, to Iowa Junction. Six offi-

cers of this railroad testified, including R. T. Scholes, assistant to the chief engineer; S. L. Porter, assistant general auditor; G. A. Hoffelder, assistant general freight agent; W. E. Haist, assistant to general manager of the lines east of the Missouri river; C. J. Connett, division superintendent of the Ottumwa division; and C. D. Peckenpugh, general superintendent of the Illinois-Wisconsin district.

The Burlington, according to the testimony of these men, is interested in furnishing adequate and reasonable service to the extent it can be done without incurring an operating loss and does not intend to abandon any of the trackage acquired. The M. & St. L. employees will retain their seniority rights in the Burlington organization as they apply to work on the Tracy-Iowa Junction line, which will become a subdivision of the Ottumwa division. The Burlington plans to absorb as many M. & St. L. employees as possible and will not permit any communities to suffer from curtailment of freight or passenger service. Indicative of the standards of maintenance, 75 per cent of the ties from Monmouth, Ill., east will have to be replaced within the next five years and a similar percentage on the other portion of the line to be taken over by the Burlington, according to the testimony.

The Chicago, Milwaukee, St. Paul & Pacific, according to its witnesses, including C. E. Oliphant, chief statistician, C. S. Christopher, general superintendent, Eastern lines and E. W. Soergel, assistant freight traffic manager, will make extensive improvements in the lines from Leola, S. D., to Aberdeen, Hanley Falls, Minn., to Norwood, Mason City, Iowa, to Albia, Algonia to Hampton and Storm City to Minerva Junction.

This road will establish through freight service between the Twin Cities and Kansas City, Mo., and St. Louis, in conjunction with the Wabash, using the M. & St. L. line from Minneapolis to Albia. This would shorten the Milwaukee's present schedule 7 hr. On the Norwood-Hanley Falls line, daily freight service will be maintained to and from Minneapolis, except Sundays. On the Leola-Aberdeen line service will be speeded up both to Aberdeen and Minneapolis.

The testimony for the Rock Island was presented by E. Rigg, general freight agent, and H. H. Siddal, statistician.

Wheeler-Crosser Bill Before Senate Committee

(Continued from page 658)

erally speaking agree with the principle that where there are consolidations the men should be taken care of, Mr. Pelley said some of them do and he doubted if he could name one who thinks nothing should be done. "I think it can be worked out without a law," he said.

Referring to Mr. Harrison's criticism of the railroad expenditures following the war Mr. Pelley said he doubted whether they could be described as constituting an expansion program. The railroads increased their facilities to some extent but much of the capital expenditure of \$7,775,000,000 since 1923 was for providing a more modern plant, improving their service, reducing operating expenses, and improving safety. Referring to the breaking off of negotiations between the committees Mr. Pelley said the railroad committee would have been willing to continue.

C. R. Gray, president of the Union Pacific, was expected to testify on April 16.

Railway Stores and Material Consumption Analyzed

Improvement seen in annual stock turnover with increased operations—Roads obtain \$36,000,000 from scrap sales

SUPPLEMENTING figures published in the *Railway Age* of March 7 comparing the aggregate book values of unapplied materials and unsold materials and supplies in stock on December 31, 1935, as reported by Class I railroads to the Interstate Commerce Commission, the *Railway Age* has prepared a detailed analysis of inventory and consumption figures, in which analysis the Class I railroads are estimated to have used materials valued at \$747,848,000 in 1935 and obtained \$36,636,000 from the sale of iron and steel scrap. Materials used include secondhand and shop-manufactured materials as well as newly purchased materials, together with

5.8 months in 1933, 5.9 months in 1932, and 4.5 months in 1931.

With the exception of fuel stock, the book value of which was considerably increased by prices, the railroads not only started out the year 1936 with smaller investments in unapplied materials than in the previous year but are shown to have considerably improved the rate at which stocks of materials are turned over annually. However, the average annual turnover is still lower than prevailed in 1929 when the total stock balance represented only a 3.8 months' stock; the stores stock was down to 3.5 months, the rail stock to 3.9 months, and the ties stock to 8.1 months' stock, based on the average monthly consumption.

These figures are based on special reports received by the *Railway Age* from 116 railroads operating more than 90 per cent of the total Class I mileage. Fuel rail, ties and scrap are reported separately from the storehouse materials because of the wide differences in the conditions and policy of handling such materials on each railroad. On most railroads, the store forces do not handle the fuel or all of the rail and tie stocks. It was also recognized in reporting the values that accounting practices are not wholly uniform throughout the country, partly because of differences in the manner of interpreting accounting rules of the I. C. C. Both inventory and consumption figures are influenced more or less by differences in the practice of valuing secondhand and reclaimed materials returned to stock and reissued for use; also by differences in methods of computing stores expense, by differences in charging materials out of

Table I—Materials on Hand December 31, 1935, Class I Railroads—Estimated
(000) Omitted

	Fuel	Day's Stock	Cross Ties	Month's Stock	Rail New & S.H.	Month's Stock
1929	\$40,000	32	\$95,000	8.1	\$45,000	3.9
1930	28,200	40	101,200	10.9	44,700	4.9
1931	23,600	31	86,150	11.7	49,250	8.5
1932	20,500	36	67,200	14.8	48,100	18.0
1933	17,950	37	50,950	13.0	33,600	14.0
1934	19,930	34	47,297	11.0	36,885	13.0
1935	22,818	37	42,020	9.9	34,275	11.7

	Miscellaneous	Month's Stock	Scrap	Total	Month's Stock
1929	\$292,000	3.5	\$.....	\$472,000	3.8
1930	246,500	3.8	10,300	430,900	3.8
1931	203,869	4.4	13,200	374,331	4.5
1932	170,000	5.5	12,800	316,800	5.9
1933	178,091	5.7	10,700	291,291	5.8
1934	181,455	5.0	11,898	297,465	4.6
1935	171,920	4.7	9,427	279,926	4.3

handling charges and stores expense. The total includes \$225,535,000 of fuel, \$34,275,000 of new and relay rail, \$51,874,000 of cross ties, and \$436,163,000 of storehouse and miscellaneous materials.

Stock balances of the Class I railroads at the close of the year, totaling \$279,926,000, included \$22,818,000 of fuel, as compared with \$19,930,000 in 1934; \$42,020,000 of cross ties, as compared with \$47,297,000 in 1934; \$34,275,000 of new and relay rail, as compared with \$36,885,000 in 1934; \$171,920,000 of store stock and miscellaneous materials, as compared with \$181,455,000 in 1934; and \$9,427,000 of scrap iron and steel.

Based on the average monthly consumption during 1935, fuel inventories represented a 37 days' stock, as compared with 34 days in 1934, 37 days in 1933, 36 days in 1932, and 31 days in 1931. Ties on hand December 31 represented a 9.9 months' stock, as compared with 11 months in 1934, 13 months in 1933, 14.8 months in 1932, and 11.7 months in 1931. Rail inventories are equal to an 11.7 months' stock, compared with 13 months in 1934; 14 months in 1933, 18 months in 1932, and 8.5 months in 1931, while store stock was equivalent to 4.7 months' requirements, compared with 5.0 months in 1934, 5.7 months in 1933, 5.5 months in 1932, and 4.4 months in 1931. The total book value of materials and supplies unapplied on December 31 represented a 4.3 months' supply, as compared with 4.6 months in 1934,

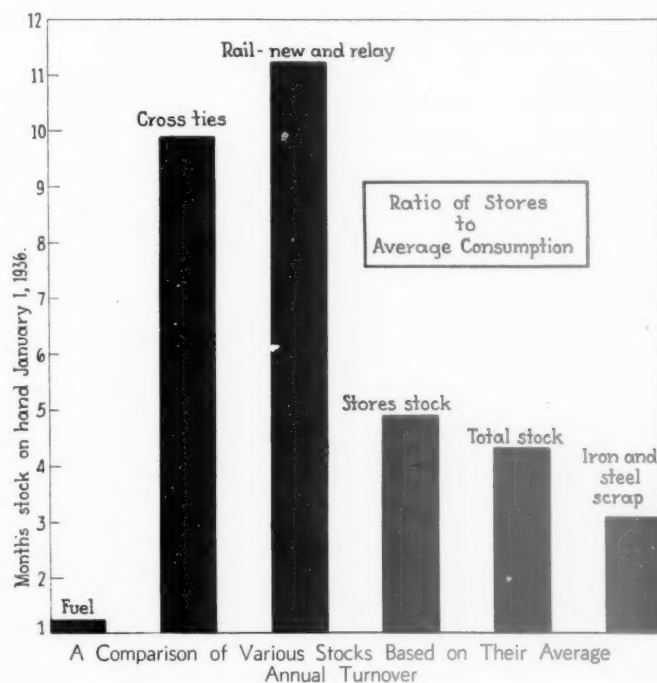
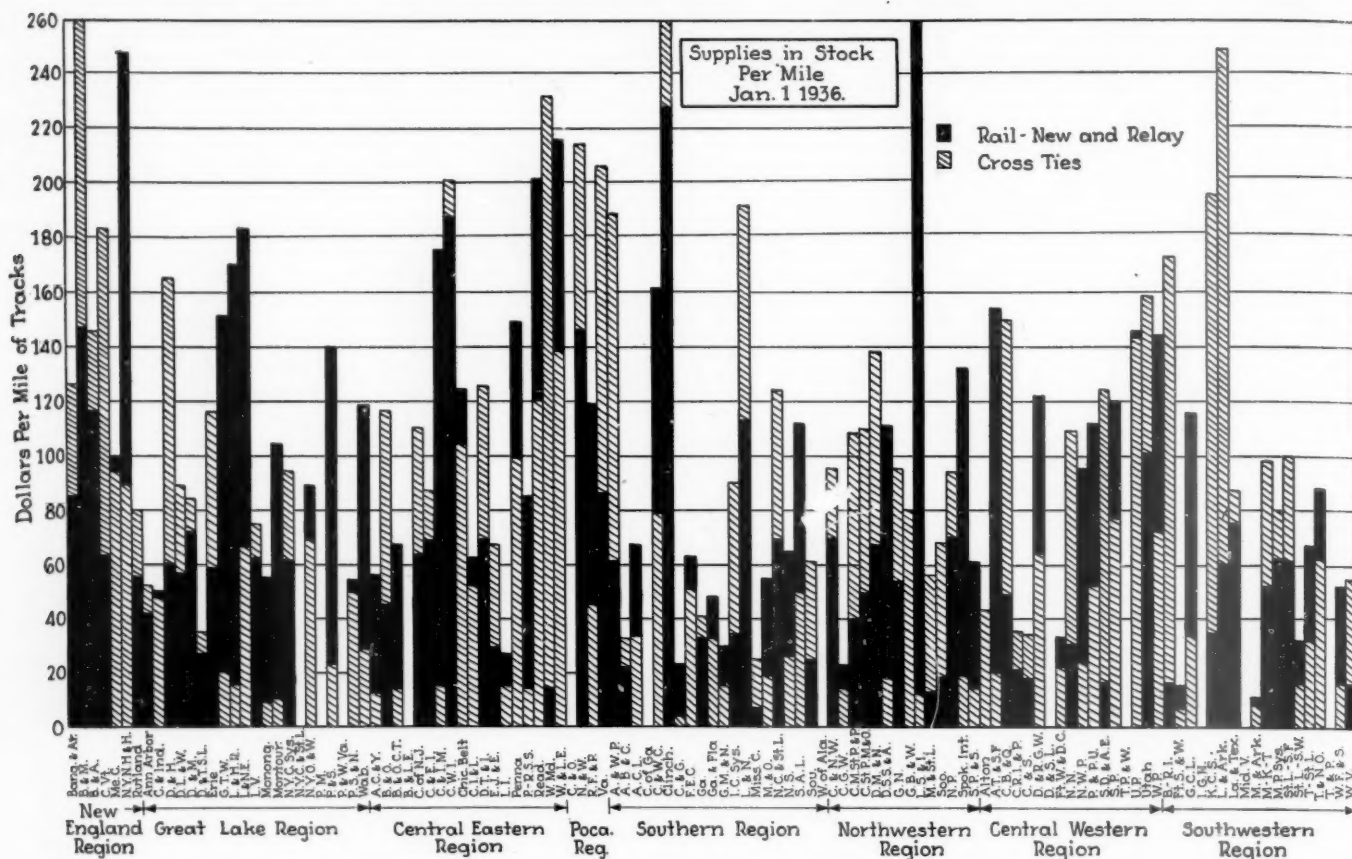


Table II—Materials and Supplies Used and

Road	Locomotive Fuel					Rail—New and Relay					Cross Ties				
	On Hand		Day's Stock	Used		On Hand		Month's	Used		On Hand		Month's	Used	
	Dec. 31	Per Cent		1935	Inc. Per Cent	Dec. 31	Per Cent		1935	Dec. 31	Per Cent	1935		Dec. 31	Per Cent
NEW ENGLAND REGION:															
Bangor & Aroostook.....	\$112,697	2	9	\$457,908	7	\$74,308	23	4.3	\$208,870	+38	\$110,888	+17	14.9	\$89,756	15
Boston & Albany.....	89,019	19	15	2,115,482	0	130,068	19	40.0	38,793	57	161,946	32	14.2	136,844	32
Boston & Maine.....	267,551	+25	26	3,701,965	4	598,193	14	6.1	115,293	20	1,450,388	+1	51.0	342,942	52
Central Vermont.....	34,454	0	29	634,878	7	41,337	52	8.7	57,134	21	130,926	+290	11.5	126,209	29
Maine Central.....	40,138	+16	16	908,888	-11	144,926	4	42.0	41,283	+94	137,565	32	6.0	270,613	84
New York, New Hav. & Hart.	347,019	+13	31	4,084,115	1	1,271,935	11	40.5	373,640	+100	462,098	5	13.5	408,789	35
Rutland.....	44,000	+1	40	405,000	2	20,932	2	9.2	38,895	21	42,843	5	8.0	64,958	17
Total 7 Roads.....	\$934,278	..	27	\$12,308,236	..	\$2,290,699	..	31.5	\$874,908	..	\$2,486,654	..	20.5	\$1,440,111	..
GREAT LAKES REGION:															
Ann Arbor.....	\$32,763	+200	25	\$471,480	10	\$17,689	14	12.4	\$16,944	+90	\$22,389	+21	3.4	\$79,884	+35
Cambridge & Indiana.....	201	71	24	30,882	1	1,845	35	3.0	7,320	..	2,915	..	2.3	15,208	..
Delaware & Hudson.....	471,096	1	9	1,893,012	1	76,669	15	3.2	284,268	28	315,270	+27	8.2	460,668	..
Del., Lack. & Western.....	245,298	+32	22	3,992,424	2	100,093	64	2.5	479,496	16	239,901	+70	9.0	318,821	..
Detroit & Mackinac.....	6,882	+21	44	57,362	-8	21,796	+113	25.5	10,138	+407	25,585	+85	14.5	20,934	..
Detroit & Toledo Shore Line	3,025	+12	8	139,904	8	4,567	59	14.5	3,749	24	4,195	+10	1.5	34,277	..
Erie.....	171,977	+14	45	4,303,204	-2	380,556	15	4.5	991,133	44	762,574	9	12.3	741,467	..
Grand Trunk Western.....	144,727	+55	29	1,815,327	14	336,714	+4	8.7	462,012	+100	44,638	6	1.2	420,094	..
Lehigh & Hudson River.....	3,614	5	11	122,416	..	25,918	+490	10.2	3,006	34	2,280	70	1.8	15,009	+32
Lehigh & New England.....	40,941	16	6	269,984	9	67,637	41	11.8	68,652	37	24,178	17	9.5	30,606	..
Lehigh Valley.....	146,496	19	13	3,950,865	14	205,716	+27	14.4	171,560	19	253,529	30	9.7	313,928	..
Monongahela.....	1,357	+68	5	93,477	-7	15,683	25	4.0	46,797	46	2,649	62	5.0	63,710	..
Montour.....	940	+34	4	84,928	13	8,620	20	5.1	22,353	+83	871	..	1.0	15,972	..
New York Central.....	1,637,250	+20	..	..	..	1,689,792	31	..	..	..	2,857,500	9	..	..	..
New York, Ontario & Western	77,961	..	32	883,688	..	94,351	..	27.0	42,202	..	74,491	..	8.1	110,779	..
Pere Marquette.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pittsburg & Shawmut.....	..	21	9	..	..	..	..	..	..	..	..	..	..	..	..
Pittsburg, Shawmut & Nor.	1,233	53	8	53,690	1	13,709	17	20.2	8,067	9	12,483	+200	2.3	36,673	..
Wabash.....	205,364	+210	31	2,402,592	5	519,225	+140	17.8	349,200	37	128,489	63	1.9	803,328	+14
Total 16 Roads.....	\$1,553,545	..	27	\$20,546,319	..	\$1,899,851	..	7.7	\$2,961,468	..	\$1,907,608	..	6.5	\$3,487,408	..
CENTRAL EASTERN REGION:															
Akron, Canton & Youngstown	\$3,458	+28	14	\$91,668	19	\$12,737	+470	..	\$283,625	..	\$2,829	+59	1.0	\$56,949	15
Baltimore & Ohio.....	281,100	+29	13	8,113,200	3	559,161	68	16.6	402,367	38	1,467,920	1	11.5	1,528,544	..
Baltimore & Ohio Chi. Term'l	14,776	+20	11	482,547	..	18,699	80	3.5	63,021	+270	3,812	+28	9.5	48,013	42
Central R. R. of New Jersey	100,663	17	13	2,727,923	35	124,209	35	16.5	90,237	+118	215,976	18	15.2	141,072	+70
Chicago & Eastern Illinois.....	21,820	+28	10	824,117	6	137,454	+106	7.0	232,838	11	167,987	+18	11.5	174,593	2
Chicago & Illinois Midland.....	2,147	..	6	140,194	..	37,119	..	9.9	44,941	40	2,657	..	1.0	31,484	..
Chicago & Western Indiana.....	10,852	+59	27	142,796	11	34,352	11	10.6	38,904	43	37,152	+24	0.2	47,841	+12
Belt Railway of Chicago.....	21,577	+8	16	487,193	4	56,984	0	13.1	52,033	+13	48,000	+15	7.1	86,572	+30
Chicago, Ind. & Louisville.....	4,346	+250	38	412,627	2	61,803	19	39.6	18,711	30	53,507	22	9.1	71,040	..
Detroit, Toledo & Irontronton	16,216	+262	21	279,327	21	48,446	19	3.9	149,180	..	88,030	2	13.0	122,296	+15
Elgin, Joliet & Eastern.....	31,617	+59	21	538,049	26	36,859	51	6.5	65,458	+20	85,250	+24	3.5	220,562	+6
Long Island.....	44,007	14	20	812,934	4	26,289	47	4.2	74,160	+5	14,332	58	1.6	107,487	..
Pennsylvania.....	868,196	+29	17	18,182,177	1	3,915,813	+120	22.4	2,066,606	+15	2,647,727	25	13.5	2,359,019	..
Penna. Read. S. S. Lines.....	8,805	48	7	432,507	..	67,227	7	8.9	90,578	..	11,130	+170	8.0	16,377	..
Reading.....	391,929	+168	35	4,110,675	1	740,273	..	10.0	88,376	72	441,446	21	24.2	219,365	1
Western Maryland.....	59,571	5	29	775,308	3	20,633	40	1.9	129,466	13	334,734	+37	11.0	367,983	+17
Wheeling & Lake Erie.....	12,383	+9	7	625,371	..	215,415	+24	9.1	284,939	..	136,849	+97	6.7	246,267	..
Total 17 Roads.....	\$1,892,863	..	17	\$39,181,613	..	\$6,113,423	..	17.4	\$4,205,383	..	\$5,759,338	..	11.8	\$5,830,455	..
POCAHONTAS REGION:															
Norfolk & Western.....	\$162,596	15	..	..	..	\$683,258	+47	..	..	..	\$996,033	+5	..	..	..
Richmond, Fred. & Potomac	49,035	14	28	\$642,530	10	53,523	+130	16.0	\$40,341	42	20,116	50	3.0	\$93,406	10
Virginian.....	11,623	+1	8	549,584	7	85,556	14	7.7	134,729	+2	206,895	1	16.0	155,707	19
Total 2 Roads.....	\$60,058	..	19	\$1,152,114	..	\$139,079	..	9.5	\$175,070	..	\$227,011	..	10.9	\$249,113	..
SOUTHERN REGION:															
Atlanta & West Point.....	\$25,768	..	41	\$226,802	..	\$30,199	..	12.0	\$30,747	..	\$86,742	..	16.8	\$65,823	..
Atlanta, Birm. & Coast.....	26,496	+170	5	203,646	1	18,131	+22	17.6	12,399	59	27,582	0	3.7	\$7,936	..
Atlantic Coast Line.....	591,742	+13	61	3,525,328	7	485,611	+11	14.3	406,133	48	241,200	+42	3.6	810,319	22
Charleston & W. Carolina.....	10,813	+21	26	152,677	2	73,367	17	19.8	44,370	+20	35,053	+81	6.1	69,555	+25
Clinchfield.....	21,820	..	10	248,937	3	96,587	..	29.0	40,131	17	141,597	+4	15.5	109,879	..
Columbus & Greenville.....	2,478	+47	11	541,155	12	10,411	+13	14.1	4,161	+10	8,110	..	4.0	36,775	2
Florida East Coast.....	109,489	19	6	601,671	6	100,805	11	4.4	27,448	66	90,987	9	6.9	143,947	..
Georgia.....	49,983	..	52	342,959	..	18,170	..	9.5	22,933	..	20,952	..	4.2	59,183	..
Georgia & Florida.....	11,167	+160	40	99,780	-9	23,014	57	8.0	34,392	48	15,578	+96	2.6	71,016	+11
Gulf, Mobile & Northern.....	13,002	+190	16	288,862	12	33,496	37	2.5	161,216	+15	17,592	63	1.2	1,186,180	+50
Illinois Central.....	349,368	+98	19	6,713,701	19	435,828	+65	7.4	707,796	37	1,555,474	6	11.8	1,186,180	2
Louisville & Nashville.....	361,458	+73	31	4,257,797	7	955,070	15	24.2	473,311	19	1,608,718	15	20.6	933,698	7
Mississippi Central.....	4,017	..	11	40,322	..	73	..	5.9	5,428	..	4,528	+70	1.2	2,508	..
Mobile & Ohio.....	27,375	7	15	864,972	69	85,267	42	2.7	379,044	52	29,262	70	1.2	292,176	+11
Nashville, Chat. & St. Louis	128,670	9	58	820,091	0	134,948	19	11.0	147,900	+18	238,469	16	12.0	237,725	19
Norfolk Southern.....	18,566	15	21	308,970	9	74,527	13	7.0	127,035	+6	31,828	31	1.8	212,312	+78
Seaboard Air Line.....	533,542	31	8	2,491,124	11	683,467	6	10.5	779,845	37	289,376	52	3.3	1,016,217	+2
Southern.....	488,429	+80	29	6,360,777	7	335,460	27	3.7	1,092,080	+30	82929				

Carried by Class I Railroads in 1935

Dec. Per Cent	Stores Stock				Total — Less Scrap				Scrap				Total On Hand Dec. 31	Road
	On Hand Dec. 31		Used		On Hand Dec. 31		Used		On Hand Dec. 31		Sold			
	Dec. 31	Per Cent	1935	Per Cent	Dec. 31	Per Cent	1935	Per Cent	Dec. 31	Per Cent	1935	Per Cent		
15	\$515,003	+1	9.0	\$694,365	1	\$813,096	\$815,539	6.7	\$1,450,899	+4	\$14,121	\$63,906	\$827,217	Bangor & Aroostook
32	1,117,899	+3	9.3	1,513,326	11	1,498,932	1,638,442	4.7	3,804,445	27	19,527	217,412	1,518,459	Boston & Albany
32	2,441,094	8	6.5	4,506,981	25	4,757,226	5,014,625	6.6	8,668,181	27	21,878	126,347	4,779,104	Boston & Maine
29	302,625	4	5.2	667,712	+12	499,342	468,049	4.0	1,489,310	+5	21,387	38,407	529,729	Central Vermont
6	844,870	3	6.6	1,513,550	+20	1,167,599	1,269,068	5.0	2,764,334	1	8,516	16,993	1,176,115	Maine Central
13	3,535,296	19	4.7	9,022,131	+7	5,616,348	6,597,180	4.8	13,889,678	3	141,546	385,824	5,757,894	New York, New Haven & Hartford
17	196,419	14	9.6	245,098	19	313,294	347,925	5.0	753,951	9	1,421	14,706	315,715	Rutland
	\$8,954,206		5.9	\$18,193,163		\$14,665,837	\$16,150,837	5.3	\$32,820,798		\$228,396	\$863,695	\$14,895,233	
435	\$188,133	+5	6.0	\$380,976	+22	\$260,994	\$230,191	3.3	\$949,284	+17	\$4,673	\$25,488	\$265,667	Ann Arbor
	36,662	6	7.2	60,809		41,623	43,069	4.3	114,219		5,973	2,870	47,596	Cambria and Indiana
46	1,283,471	13	4.7	2,321,756	9	2,146,407	2,292,495	4.4	5,869,704	6	68,569	134,520	2,214,675	Delaware & Hudson
11	126,558	+1	20.0	75,794	+47	180,821	157,459	13.0	9,912,876	3	45,567	264,060	1,968,959	Delaware, Lackawanna & West.
420	61,221	8	5.2	140,555	+2	73,008	118,240	2.7	318,932	+9	887	3,465	73,895	Detroit & Toledo Shore Line
468	1,945,935	+1	3.0	7,886,219	5	3,260,142	3,370,348	2.8	13,922,023	14	265,826	1,901,586	3,525,968	Erie
411	979,256	+4	4.9	2,402,438	+20	1,595,335	1,393,977	3.5	5,099,871	+21	47,512	411,029	1,552,847	Grand Trunk Western
432	45,779	2	9.3	75,178	31	77,582	62,662	4.3	215,609	20	625	5,122	78,207	Lehigh & Hudson River
27	200,790	7	8.0	300,661	23	333,546	409,362	6.0	669,803	15	6,089	52,170	339,635	Lehigh & New England
411	1,954,868	+6	4.6	5,086,042	22	2,560,669	2,474,450	3.2	9,522,395	10	134,612	505,626	2,095,281	Lehigh Valley
10	194,665	12	8.7	266,644	+13	214,354	251,871	6.7	377,152	23	227	8,398	214,581	Monongahela
10	127,917	3	8.7	176,361	23	139,948	145,865	5.5	299,614	10	7,548	14,788	146,896	Montour
10	18,985,591	12	7.9	710,170		25,170,133	28,534,773		547,411				25,717,544	New York Central
40	408,415		7.0	710,170		655,218	1,037,590	4.5	1,746,839		57,905	309,061	713,123	New York, Ontario & Western
40	75,376	+1	2.3	38,796	32	101,615	86,504	10.1	119,031	11	1,938	1,932	1,352,819	Pere Marquette
38	69,825	15				97,850	106,168				997	8,654	103,583	Pittsburg & Shawmut
414	1,040,924	+1	3.0	4,165,536	+1	1,894,002	1,636,407	2.9	7,720,656	+1	22,826	217,032	98,347	Pittsburg, Shawmut & Northern
	\$10,007,061		3.9	\$30,120,070		\$15,368,086	\$15,691,265	3.2	\$57,022,236		\$671,183	\$3,877,382	\$16,039,269	Wabash
15	\$72,120	+10	3.3	\$256,845	+96	\$91,144	\$87,717	1.9	\$689,087	+150	\$1,533	\$84,012	\$92,677	Akron, Canton & Youngstown
5	5,129,023	11	3.0	20,620,759	1	7,437,204	8,803,719	2.9	39,664,870	+1	168,410	1,666,800	7,605,614	Baltimore & Ohio
42	146,566	17	1.6	1,062,082	+8	183,882	286,445	1.3	1,655,663	+10	1,900	72,018	185,782	Baltimore & Ohio Chl. Terminal
470	997,819	17	4.3	2,791,312	+5	1,438,667	1,764,558	3.0	5,750,544	+6	63,541	534,201	1,502,208	Central Railroad of New Jersey
4145	302,008	4	2.7	1,611,433	+5	689,210	601,222	2.9	2,492,981	+3	51,769	292,492	740,988	Chicago & Eastern Illinois
412	215,253	60	4.9	548,424	+6	257,176	270,579	4.0	765,043	+2	6,476	31,088	362,652	Chicago & Illinois Midland
430	201,487	5	4.9	491,232	0	283,848	290,288	4.7	720,773	1	29,439	65,827	313,282	Chicago & Western Indiana
8	154,484	0	6.7	279,349	+5	281,055	274,030	3.7	899,147	+7	20,854	63,275	301,909	Belt Railway of Chicago
430	494,806	+35	8.4	710,122	+18	614,462	681,992	6.1	1,212,500	+19	18,213	62,500	632,675	Chicago, Indiana & Louisville
415	277,675	13	4.5	732,226	+25	430,367	473,970	4.3	1,183,029	+25	9,280	27,028	439,647	Detroit, Toledo & Ironton
46	548,451	31	4.2	1,549,855	+38	702,577	957,461	3.5	2,364,924	+33	28,345	146,136	730,922	Elgin, Joliet & Eastern
46	755,149	1	3.4	2,636,730	+48	839,767	888,701	2.7	3,631,251	+32	10,651	56,681	850,418	Long Island
15	17,877,429	3	4.1	51,880,102	12	25,309,165	24,488,298	4.1	74,508,898	9	1,379,210	2,905,666	26,688,375	Pennsylvania
1	63,896	8	2.7	283,192		151,058	162,818	2.2	822,654		5,644	82,620	156,702	Penna.-Reading Seashore Lines
417	3,468,890	+1	10.2	4,105,660	24	5,042,558	4,957,314	7.1	8,524,076	15	61,035	666,305	5,103,593	Reading
417	918,869	12	6.1	1,799,938	10	1,333,807	1,378,285	5.2	3,072,695	4	60,716	290,569	1,394,523	Western Maryland
	696,189	1	3.1	2,696,849		1,060,836	955,881	3.3	3,853,426		6,171	137,270	1,067,007	Wheeling & Lake Erie
	\$32,371,143		4.1	\$94,047,110		\$46,146,787	\$47,323,278	3.8	\$143,161,561		\$1,923,187	\$6,584,578	\$48,069,974	
10	\$4,135,952	+16	5.9			\$5,977,768	\$5,147,016				\$50,813		\$6,028,582	Norfolk & Western
19	642,264	+10	9.5	\$810,164	+10	764,938	738,550	5.8	\$1,586,441	+10			764,938	Richmond, Frederik. & Potomac
	1,298,878		9.3	1,594,712	+4	1,512,352	1,408,929	7.5	2,394,732	+3	19,366	\$114,103	1,531,718	Virginian
	\$1,851,142		9.3	\$2,404,876		\$2,277,290	\$2,147,479	6.9	\$3,981,173				\$2,296,656	
1	\$160,004					\$302,713	\$290,972				\$26,137	\$31,106	\$328,850	Atlanta & West Point
22	237,244	+27				309,453	238,960						309,453	Atlanta, Birmingham & Coast
42	1,430,312	16	4.2	\$4,118,117	17	2,748,905	3,166,012	3.7	\$8,857,898	16	57,335	457,198	2,806,240	Atlantic Coast Line
4	76,584	20	5.2	173,714	+8	1,163,167	1,173,714	3.8	440,816	+6	14,842	21,191	2,659,659	Charleston & Western Carolina
2	231,940	2	6.2	416,933	9	474,397	477,685	6.8	846,947	+3	85,419	73,789	969,811	Cincinnati
4	105,104	8	7.8	163,998	+10	113,807	122,328	4.7	287,541	+1	2,018	4,286	115,825	Columbus & Greenville
411	1,095,798	+1	14.2	930,678	+11	1,387,079	1,411,307	9.2	1,793,744	+3	35,316	37,703	1,422,395	Florida East Coast
450	335,111					424,216	441,144				1,494	35,783	425,710	Georgia
411	73,152	+12	6.7	130,404	17	122,911	140,855	4.4	335,592		5,341	9,575	128,252	Georgia & Florida
450	342,023	+12	9.1	452,527	6	406,118	412,222	4.5	1,073,915	+8	16,511	47,577	422,624	Gulf, Mobile & Northern
2	4,365,002	18	4.7	10,978,765	37	6,305,672	7,097,466	5.9	19,586,442	23	512,713	1,891,661	6,818,385	Illinois Central
45	4,377,291	+7	9.4	6,256,578	+48	7,802,221	7,738,221	7.9	11,918,894	+4	552,919	1,560,919	8,355,857	Louisville & Nashville
411	47,308	2	8.1	70,512	+25	57,185	59,763	4.9	140,076	+25	2,132	2,724		



Book Values of Rail and Cross Tie Stocks per Mile of All Tracks—Height of Black and Shaded Columns Measured from Base Line in Each Case—No Data where Blank Spaces Appear in Chart

stock when issued, and also the relative amounts of obsolete, retired or otherwise unserviceable materials included in stock balances. Subject to these fundamental differences, the statistics are made as uniform as possible by reporting as inventories all undisbursed mate-

rials, including ties at treating plants, and limiting the materials used to the value of materials issued only to closed accounts.

The turnover figures were developed for each class of material by dividing the total consumption reported

Table III—Approximate Quantities of Material in Stock December 31, 1935

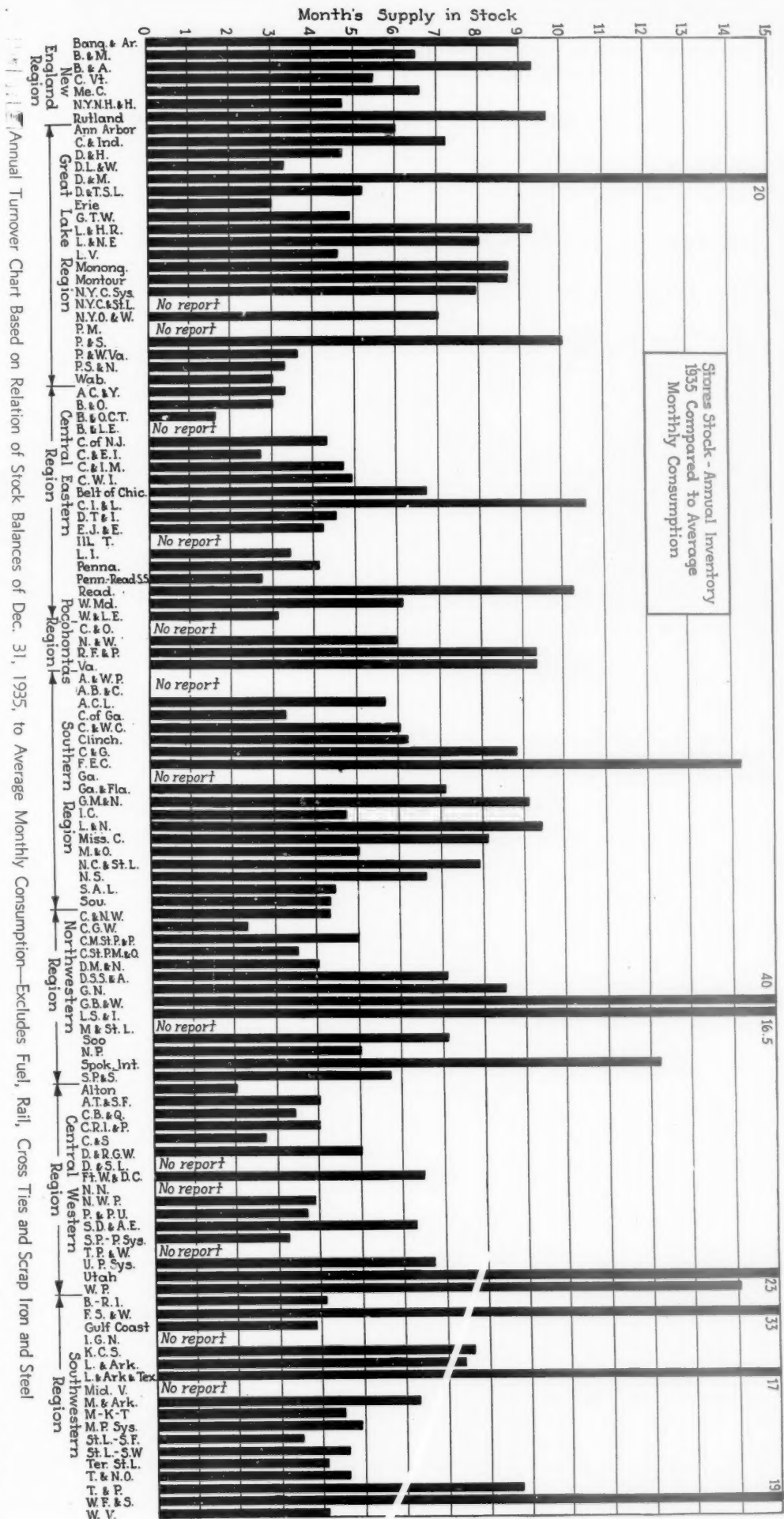
	Locomotive Fuel		Rail—New & S.H. (Tons)	Cross Ties (Number)	Scrap (Tons)		Locomotive Fuel		Rail—New & S.H. (Tons)	Cross Ties (Number)	Scrap (Tons)
	Coal (Tons)	Oil (Bbl.)					Coal (Tons)	Oil (Bbl.)			
A. C. & Y.	1,300	12	331	2,716	128	I. G. N.	301	3,175	3,768	157,097	—
Alton	27,785	370	17,181	170,318	—	K. C. S.	3,808	372,803	—	—	—
A. & W. P.	9,573	212	1,274	64,412	2,223	L. S. & I.	14,424	55	3,400	5,525	1,066
A. B. & C.	11,068	—	931	41,216	—	L. & N. E.	10,802	48	2,134	20,155	474
B. & O.	161,860	2,668	22,674	—	14,645	Lehigh Val.	45,722	940	6,769	186,256	10,903
Bang. & Arroos.	22,718	—	3,085	204,479	—	La. & Ark.	95	186,729	3,678	324,584	539
B. & A.	19,809	—	5,510	148,613	2,218	La. Ark. & Tex.	—	12,078	1,269	47,639	465
B. & M.	59,828	—	23,369	952,345	3,125	L. & N.	210,966	—	37,307	1,373,487	—
B. A. & P.	135	—	552	14,358	595	Maine Cent.	8,018	—	6,357	108,428	1,085
Cambria & Ind.	106	—	92	2,674	590	M. & St. L.	13,166	—	2,212	140,010	2,100
Cent. Vt.	9,156	—	1,243	77,260	3,558	M. St. P. & S. S. M.	40,376	—	4,732	414,481	—
Cent. of N. J.	31,973	697	3,497	160,812	2,708	Mo. & Ark.	431	—	973	8,640	1,125
C. & E. I.	11,825	214	3,962	195,577	1,980	Monongahela	725	48	612	1,625	27
C. & I. M.	1,042	399	1,620	2,083	448	Montour	438	15	282	844	709
C. & N. W.	199,546	104,397	—	—	—	N. C. & St. L.	60,426	—	5,145	246,526	—
C. G. W.	8,435	784	2,526	32,671	1,415	Nev. Nor.	1,478	—	119	—	—
C. St. P. M. & O.	24,625	2,055	5,550	384,693	3,872	N. Y. O. & W.	34,664	—	3,614	57,075	5,185
Clinchfield	2,556	—	3,618	174,074	9,137	Norfolk Sou.	5,400	—	3,488	54,103	—
Colo. & Sou.	13,200	3,255	895	53,933	1,775	N. P.	128,914	45,483	28,653	977,462	—
Col. & Green.	811	92	271	1,100	244	N. Y. N. H. & H.	86,940	—	38,083	472,205	17,806
D. L. & W.	52,342	822	4,598	230,254	5,002	P. & P. U.	1,391	120	770	4,613	142
D. & R. G. W.	27,505	—	20,160	400,232	1,006	P. & S.	475	—	974	3,113	168
Det. & Mack.	1,662	—	1,004	46,375	27	P. S. & N.	640	—	769	13,253	126
D. & T. S. L.	874	—	189	2,497	232	Reading	128,712	779	815,199	—	—
D. T. & I.	6,534	—	2,790	103,705	1,298	R. F. & P.	13,430	—	1,787	27,633	—
D. M. & N.	57,695	1,015	2,532	129,390	2,390	Rutland	10,100	—	1,800	19,123	—
D. S. S. & A.	5,089	—	3,891	22,654	6,300	St. L. S. W.	2,802	309,397	4,771	72,763	—
E. J. & E.	16,777	352	1,138	61,937	3,070	S. A. L.	195,255	390	32,938	432,261	18,773
Erie	87,471	2,130	13,405	629,189	21,243	Southern	274,199	—	16,237	918,800	44,608
F. E. C.	—	121,994	3,887	115,108	5,145	S. P. & S.	—	79,611	2,148	21,746	1,714
Ft. S. & W.	193	—	—	—	—	Spokane Int.	234	—	911	9,445	451
Ft. W. & D. C.	1,126	237,924	981	22,691	1,825	Term'l of St. L.	7,203	56	588	7,116	—
Georgia	13,331	252	1,118	19,834	198	T. & N. O.	1,267	5,713	22,655	491,051	—
G. T. W.	43,161	—	13,283	32,950	5,322	U. P.	295,845	461,547	97,216	2,745,431	27,322
G. N.	281,778	207,247	—	—	—	Utah	835	—	1,135	23,605	26
G. B. & W.	1,343	—	3,047	36,832	1,632	Virginian	9,648	—	3,340	243,838	—
G. C. L.	—	287,866	7,528	73,707	6,684	Western Md.	30,955	675	876	315,489	5,072
G. M. & N.	5,151	673	3,323	46,042	5,500	Western Pac.	17,876	96,368	9,021	205,686	2,381
Ill. Cent.	182,018	7,979	19,645	1,291,700	—	W. & L. E.	6,317	266	7,805	151,542	673
						W. F. & S.	41,505	—	446	4,311	—
						Wichita Val.	183,050	—	153	22,149	33

No data where blank spaces occur in table.

for the year by 12 to obtain a theoretical average monthly consumption, and dividing the result into the stock balances. While such a measure of stock is alone far from satisfactory with such material as rail and ties which are not applied uniformly throughout each year and which are used very rapidly during normal track improvement programs, turnover is regarded by stores forces as the fairest measure of supply department efficiency. However, the analysis supplements the turnover figures by including data showing the percentage change of the 1935 inventory and consumption figures from the previous year, and also by equating the rail and tie stocks in terms of dollars per mile of all tracks.

The book values of fuel on hand at the close of 1935 were larger on 65 of 100 reporting roads and lower on 35 roads, according to the analysis; and the consumption of fuel during 1935 was greater on 90 roads. Book values of new and relay rail on hand were larger on 31 roads and lower on 69 roads, and the consumption during 1935 was less in the aggregate on 56 roads and greater on 44 roads. Book values of cross ties on hand showed increases on 30 roads and smaller stocks on 70 roads, with the consumption during 1935 greater on 41 roads and lower on 59 roads. Store house inventories showed reductions on 65 roads and increases on 35 roads, with the consumption increasing on 50 roads and showing reductions on the same number of other roads.

The average regional annual turnover of fuel stock was 17 days and 19 days, respectively, in the Central Eastern and the Pocahontas regions as compared with 27 days in the New England and Great Lakes regions; 36 days in the Southern region; 28 days in the Northwestern region; 51 days in the Central Western region; and 71 days in the Southwestern region. The highest regional average turnover of rail stock was 6.2 months in the Northwestern region,



as compared with 7.7 months in the Great Lakes region; 31 months in the New England region; 17.4 months in the Central Eastern region; 9.5 months in the Pocahontas region; 9.6 months in the Southern region; 14.5 months in the Central Western region, and 9.8 months in the Southwestern region.

The average regional turnover of cross tie stocks was highest in the Great Lakes region where the average was 6.5 months, as compared with 7.1 months in the Southern and Southwestern regions, respectively; 7.9 months in the Northwestern region; 10.9 months in the Pocahontas region; 11.8 months in the Central Eastern region; 13.2 months in the Central Western region and 20 months in the New England region. The highest average regional turnover of stores stock was 3.9 months in the Great Lakes region, as compared with 4.1 months in the Central Eastern region; 5.6 months in the Southern region; 5.9 months in the New England region; and

4.9 months in the Western district. The highest regional average turnover of total stock, exclusive of scrap, was 3.2 months in the Great Lakes region; while the average of 4.2 months in the Northwestern region was the highest rate of turnover in the Western district.

Iron and steel scrap on hand at the close of 1935 represented 3 per cent of the book value of other materials; and when compared to sales, the combined total book value of scrap on hand as equal to a 3.08 months' supply, representing a turnover of scrap four times a year. Aggregate cross tie stocks on December 31, including ties at treating plants and unapplied ties on line of road, were equivalent to \$105 per mile of all tracks; while the combined book value of rail on hand, consisting largely of relay and used rail, was equivalent to \$85 per mile of all tracks.

For further comparisons with previous years, the reader is referred to the *Railway Age* of April 13, 1935.

Communications and Books . . .

The Railway Age cannot publish letters from readers who do not supply their names and addresses. Names of correspondents are not published, or disclosed even upon inquiry, unless the correspondent consents. But they must be given us as an evidence of good faith.

Preventing Boiler Explosions From Low Water

SPRINGFIELD, MO.

TO THE EDITOR:

The article by Frank E. Russell in the March 21 issue of the *Railway Age*, "Can Boiler Explosion Due to Low Water Be Prevented?" is exceedingly interesting to me, because I am a firm advocate of plenty of crown-sheet protection.

I agree with Mr. Russell that the drop plug is a good protection and the examples given prove that it has in many cases averted a bad explosion. I believe, however, that Mr. Russell has dwelt a little too much on the protection afforded against overheated crown sheets due to low water by the application of drop plugs, because even though the drop plugs have been applied there are still possibilities of explosion. For example, Mr. Russell refers to the low-water case involving Southern Pacific locomotive 4350 on descending grade. The fact that the crown sheet had been exposed twenty-two rows of stays back from the flue sheet with no damage to the crown sheet would indicate to me that there must have been a very light fire, and it is only reasonable to conclude that had the locomotive been going up hill the conditions might have been much different. With the water as low as stated by Mr. Russell and the locomotive working with a bright fire, it is very likely there would have been a disastrous explosion.

The crown sheet is the most sensitive part of the locomotive boiler. For that reason the best possible means of protecting it should be used. There must be something more than a warning in the event of low water. When the water is out of sight in the water glass it should be warning enough that the water is getting low in the boiler, yet the human element makes it necessary that additional protection be provided, such as the low-water alarm, drop plugs, or the Thermic Syphon.

The most positive protection is afforded by the Thermic Syphon. Experience has proved that by its discharge of water over the crown sheet and the girder support that it provides, it will actually prevent explosion during periods of low water. As long as there is any water in the boiler, even if its level falls below the crown sheet, there will be water surging over the crown sheet to keep it wet.

In addition to warning or protective devices, of course, careful

inspection and maintenance is of the utmost importance. Also, plenty of responsibility should be placed on the supervisor and fire builder in connection with the building of fires. I am a firm believer in the maintaining of a fire builder's book to be signed jointly by the supervisor and the fire builder before the fire is started to certify beyond a doubt that the boiler is full of water. Many a crown sheet has been ruined in the roundhouse because of failure to require the supervisor and fire builder to jointly certify that the boiler is actually full of water.

F. G. LISTER,
Superintendent motive power,
St. Louis-San Francisco.

New Book

Speed, Space and Time, by Vernon Sommerfield. 299 pages, 7 7/8 in. by 5 1/4 in. Illustrated. Bound in cloth. Published by Thomas Nelson & Sons, Ltd., London, Eng. Price, \$2.50.

Here is a brief and fascinating story of "man's attack upon space and time through the development of transport by land, sea and air." Startled by the author's dramatic assertions that "the Romans, who began the monumental Appian Way over 300 years before Christ, were able to travel as fast as their eighteenth-century descendants" and that "there was virtually no increase in land speeds from the time of Julius Caesar to that of the battle of Waterloo," one is brought to a new realization of how the world of transport has moved in the past century or so of its development from the pioneering mechanical vehicles of the early 1800's to the streamlined train, the automobile, the luxury liner and the aeroplane of today.

While the book is concerned in the main with achievements of the past 50 years, it does take time for brief speculation on transport in pre-historic times before proceeding to consider in turn the ship, the highway, the railway and air transport. In his discussion of railways the author claims, among other novel revelations, that interchangeable containers for freight transport were suggested as early as 1830; and that experiments in air-conditioning of passenger cars, "so often regarded as of foreign origin," were made "so long ago as 1906 on the lines forming the East Coast Route to Scotland." Also, he finds it significant that "in the two countries in which the railway system has reached its highest stage of development—Great Britain and the United States—state ownership does not exist." A final section looks into the future, speculating on such things as the cost of speed, the prospects for railway electrification, the problem of the highways, rocket planes, and remote control of vehicles.

The book is especially well illustrated, with several pages of photographs and numerous sketches scattered throughout.

NEWS

Government-Owned Lines Are Deficit Producers

Such operation in U. S. would have brought depression loss of 10 billion, says Dunn

"If the government had owned and operated the railways during the six depression years 1930-1935, inclusive, it probably would have incurred a railroad deficit of at least \$10,000,000,000 which the taxpayers of this country would have had to pay, in addition to all other costs of government incurred during this period," said Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Company and editor of the *Railway Age*, in an address at Des Moines, Iowa, on April 10 at the conference of the Mid-West Economics Association. "This estimate is based upon three different kinds of actual experience definitely indicating that government management would not have reduced operating expenses to offset the great decline in railway gross earnings that occurred. First, government operation of railways in this country actually increased operating expenses 10 per cent in 1919, when traffic declined 10 per cent. Second, the federal government has not reduced, but has increased, its ordinary expenditures during the depression years. Third, government-operated railways in other countries have not reduced their operating expenses during the depression years as privately-managed railways have.

"The operating expenses of our railways under private management were \$10,400,000,000 less during the six depression years 1930-1935, inclusive, than they were in the six preceding prosperous years, the average annual reduction being \$1,731,000,000. The same kind of political pressure which has prevented the ordinary expenses of government from being reduced undoubtedly would, under government management, have prevented this tremendous reduction of railway operating expenses. The railroad deficit incurred would have been just about equivalent to the six years' reduction of operating expenses actually accomplished by private management.

"The operating expenses of our railways under government management in 1919, after the war was over, were \$4,400,000,000, or almost 86 per cent of their gross earnings. In 1935 they were only \$2,591,500,000, or only 75 per cent of their gross earnings. In 1933, when the operating expenses of our railways consumed only 73 per cent of their gross earnings, the oper-

ating expenses of some government-managed railways were the following percentages of their gross earnings: Germany, 105 per cent; Italy, 119; Belgium, 107; Denmark, 114; Norway, 111½; France, 118. Practically every government-managed railway system in the world has incurred deficits during the depression that have had to be paid from taxes, while under private ownership and management our railways have received no aid from the public excepting in the form of loans that will be repaid.

"This inability of government management subject to political pressure, to avoid incurring deficits is one of the very strongest arguments against government ownership. The most important question immediately raised by the advocacy of Senator Wheeler's bill for government ownership and management of railways is—what kind of government would do the managing? Unless we are going to have a revolution in this country our railroads would be managed by the same kind of government that we always have had and have now. That is democratic government—government by politicians elected by the people and by men appointed by the elected politicians for political reasons.

"Excepting in countries having autocratic governments, such as Prussia and Japan before the war, government railways throughout the world both before and since the war almost invariably have been operated at heavy losses to the taxpayers. Furthermore, the wages paid employees by privately-managed railways almost invariably have been as high or higher, the rates they have charged travellers and shippers as low or lower and the services rendered by them as good and safe, as those of government-managed railways. The most outstanding difference always has been in the economy of operation.

"The taxpayers of this country—and they include everybody—may well regard with great apprehension the prospect of the gigantic deficits that government management of railways inevitably would add to their already oppressive actual and prospective tax burdens."

Railway Club of Pittsburgh

On account of flood conditions, the meeting scheduled for March 26 was postponed and the paper which E. W. P. Smith, consulting engineer, Lincoln Electric Company, Cleveland, Ohio, was to have presented on that date on "Applied Welding with Particular Reference to Railroads" will be presented at the meeting on April 23; Fort Pitt Hotel, English room, 8 p.m.

Truckers Ask Nation-Wide Probe of Storedoor Service

A.T.A. requests I.C.C. to broaden Eastern investigation to include West and South

The American Trucking Associations, Inc., has filed with the Interstate Commerce Commission a petition asking it to broaden its recently ordered investigation of railroad pick-up and delivery to make it national in scope. The petition urged that the commission consider store-door services of the railroads in the West and South, which have been in effect for several months, as well as those of the eastern railroads, whose tariffs were suspended March 31, the day before they were to become effective. The national trucking organization led the fight against the suspended tariffs. Previously, it had objected to the plan of the western and southern roads, but the I.C.C. had declined to suspend the tariffs.

In its latest move, the truckers association asked the commission to: Make the investigation nation-wide; reconsider its orders denying suspension of the western and southern tariffs; cancel all tariffs providing for an allowance to shippers who perform the service for themselves; and cancel "all tariffs which offer transportation in violation of the motor carrier act."

Asserting that "grave and fundamental principles of law and transportation economics are involved," the petition stated a "monopolistic and destructive competitive situation" would be established if independent truckmen were regulated by the I.C.C. while the highway operations of the railroads were not.

"If the conditions which have arisen by reason of these tariffs and motor vehicle operations are not fully investigated and appropriate jurisdiction taken," the association warned, "the inevitable effect will be nullification of the purposes of the law and strangulation of the motor carrier industry." It was contended that if the railroads offer truck service, it must be regulated by the commission under the motor carrier act. Thus, it was argued, all questions involving violations of the law in regard to certificates and permits, division of rates, proper payment for service, tariff publication, accounting and acquisition of control of motor carriers, should be taken up by the I.C.C.

The trucking interests also charged that the railroad tariffs violate provisions of the original interstate commerce act which prohibit discrimination, preferences, dissi-

pation of revenues, rebates, etc. "Through the express company device," the petition added, "railroads are engaging in cut-throat competition with motor carriers by transporting goods at 'express' rates, which are below freight rates and include free pick-up and delivery."

Traffic Club of Philadelphia Hears R. F. Bohman

Raynard F. Bohman, general traffic manager of Heywood-Wakefield Company, Gardner, Mass., and chairman of the National Industrial Traffic League's national committee for the prevention of government ownership of the railroads, discussed that subject at the April 13 meeting of the Traffic Club of Philadelphia, Pa., Mr. Bohman said the prospect of government ownership was an imminent danger because most people, business men included, were "unconsciously" promoting it.

"Business interests are living temporarily in a fool's paradise," he continued, "but will awaken some bright morning and find that the railroad burden has fallen on the bowed shoulders of patient Uncle Sam, and that the first treck in the cause of state socialism which will finally engulf all industries has commenced." He said the danger of government ownership had never come from its advocacy but from policies intended to destroy the earning capacity of the railroads under private ownership. That policy, he added, was reflected in bills in Congress now, sponsored and advocated by railroad labor, which would so increase railroad operating costs as to make private ownership and operation impossible and government ownership necessary.

Mr. Bowman said it was hoped soon to hold a joint meeting of his committee with the directors of the Association of American Railroads for the purpose of formulating a national plan of action that can be supported by both shippers and railroads.

Santa Fe Will Cut California Time and Add Two Trains on May 10

The Atchison, Topeka & Santa Fe, on May 10, will place the Scout on a 60-hr. 55-min. schedule between Chicago and Los Angeles, Cal., and will reduce the schedule of its Chief $2\frac{1}{4}$ hr. westbound and 4 hr. 35 min. eastbound. On May 12, it will place in service the Super Chief, a train of standard Pullman equipment drawn by a 3,600-hp. locomotive, on a 39 $\frac{3}{4}$ -hr. schedule between Chicago and Los Angeles. The Super Chief will leave Chicago at 7:15 p.m. on each Tuesday and will arrive in Los Angeles at 9 a.m. each Thursday, while eastbound it will leave Los Angeles at 8 p.m. each Friday and will arrive in Chicago at 1:45 each Sunday. The 39 $\frac{3}{4}$ -hr. schedule of the Super Chief will be 14 hr. faster than the present fastest service between Chicago and California. Later in the year, the cars of this train will be replaced by light-weight, stainless steel cars recently ordered from the Budd Manufacturing Company. The extra fare on the Super Chief will be \$10.

With the inauguration of this train, the Chief, which made its first run on November 14, 1926, will operate on a schedule of 51 hr. 29 min. westbound instead of

53 $\frac{3}{4}$ hr. and 54 hr. 25 min. eastbound instead of 59 hr. It will leave Chicago at 12:01 p.m. instead of 11:15 a.m. and will arrive in Los Angeles at 1:30 p.m. the third day instead of 3 p.m., while returning, it will leave Los Angeles at 9:30 a.m. instead of 11:45 p.m. and will arrive in Chicago at 1:55 p.m. the third day instead of 8:45 a.m. the fourth day.

The Scout, which is designed primarily for the convenience of coach and tourist travel, will leave Chicago at 8:45 p.m. and arrive in Los Angeles at 7:40 a.m. No major changes are contemplated in the daily schedules of either the California Limited or the Grand Canyon Limited, but the latter will carry a new tri-weekly tourist Pullman from Chicago to Los Angeles by way of the Grand Canyon each Tuesday, Thursday and Saturday, commencing June 16. The Super Chief, the Chief, the California Limited and the Grand Canyon Limited will all be completely air-conditioned.

New Orleans-Los Angeles Service

The Southern Pacific, on May 3, will speed up its passenger service between New Orleans, La., and Los Angeles, Cal. The Sunset Limited, between New Orleans and Los Angeles, will depart in the morning instead of the evening and will be run through to San Francisco. A new train, the Argonaut, will be operated on the present Sunset Limited schedule between New Orleans and Los Angeles. Both trains will carry deluxe coaches and lounges and standard and tourist sleeping cars, all of which will be air-conditioned. The Sunset Limited will leave New Orleans at 11:20 a.m. instead of 11 p.m. and will arrive in Los Angeles at 5 p.m. the third day instead of 7:30 a.m. the fourth day and at San Francisco at 8:10 a.m. the fourth day. Returning, the Sunset Limited will leave San Francisco at 6:45 p.m. and Los Angeles at 9:10 a.m. instead

of 8 p.m. and will arrive in New Orleans at 6 p.m. instead of 7:25 a.m. Eastbound, the schedule will be 54 hr. 50 min., or 2 hr. 35 min. faster than the present schedule.

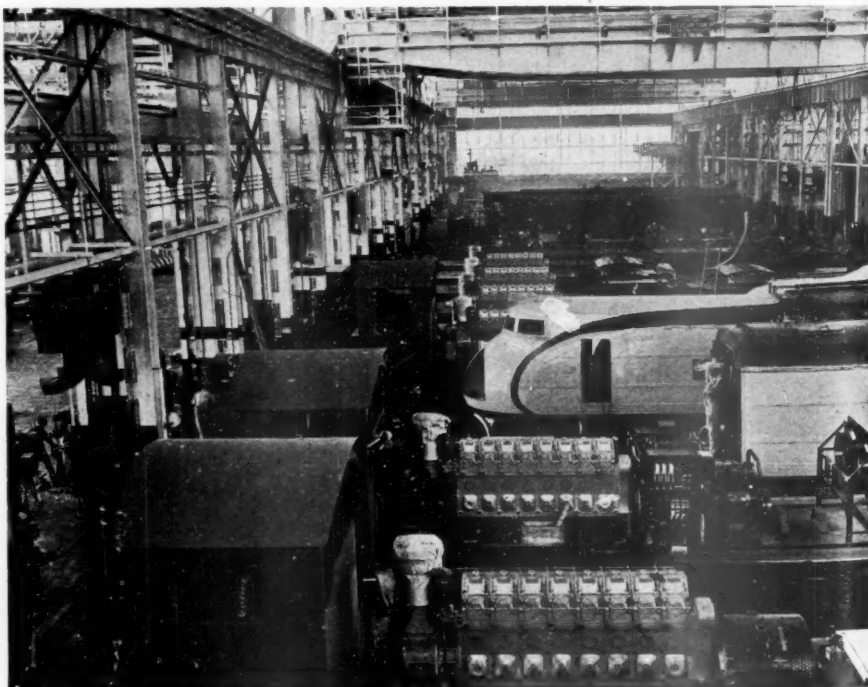
Public Hearings on Container Specifications

Under a plan arranged by the Perishable division of the Freight Container Bureau of the Association of American Railroads, public hearings for the convenience of shippers and container manufacturers interested in fresh fruit and vegetable traffic will be docketed each year. The first hearing of each series will be held on the first Tuesday in the months of February, June and October at such cities as New York, Chicago, San Francisco, Houston, Tex., and Jacksonville, Fla. By docketing the subjects for public hearing, shippers and manufacturers will have ample time to anticipate their needs with reference to new specifications or carloading rules, which will be incorporated in the existing tariffs. Each series of hearings is planned to consume approximately two weeks.

In order to have a subject docketed for public hearing, it is necessary that the proponent of the subject prepare in full a formal application on Form F.C.B. No. 1, and file the application with the chief engineer of the Freight Container Bureau 25 days prior to the opening date of the series of meetings at which the subject is to be presented. Persons interested in the docketed subject may appear at a public hearing and express opinions on any of the proposals under consideration.

Electro-Motive Diesel Plant Now in Production

The practice period for breaking in machinery and workmen at the new plant of the Electro-Motive Corporation, LaGrange, Ill., has been completed and work is now



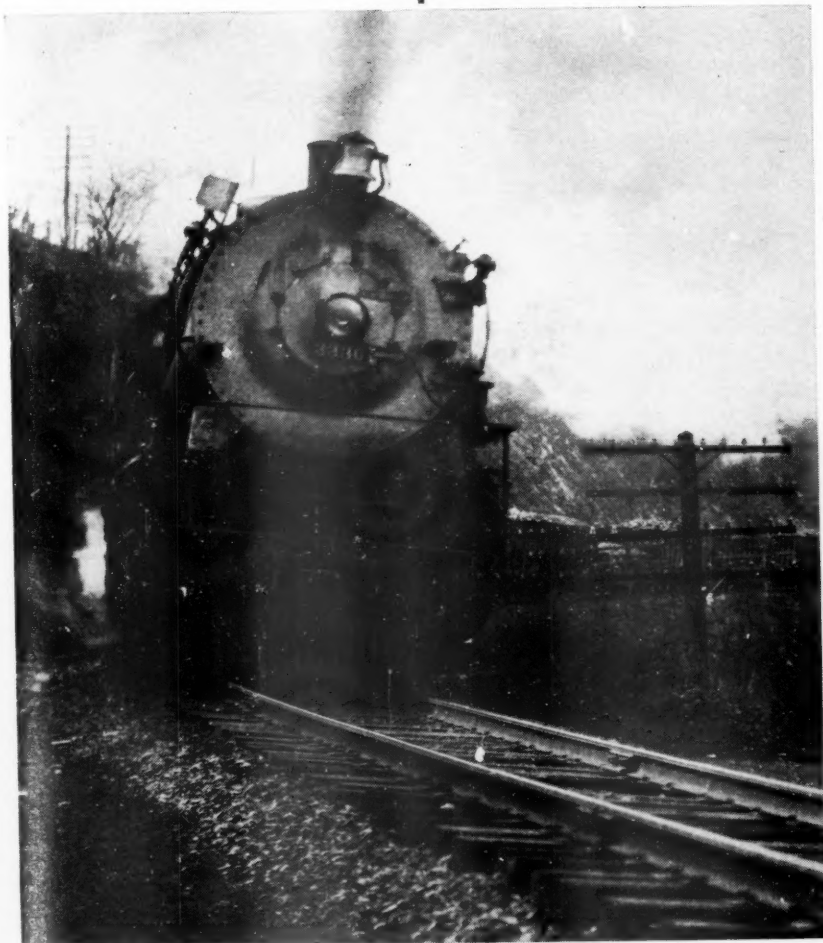
General View of the Erecting Shop of the Electro-Motive Corporation Plant at La Grange, Ill.

Continued on next left-hand page

MORE TONNAGE

At Higher Speeds

and lower Costs



Capacity trains at higher speeds spread operating expense over more ton-miles. »

Modern locomotives set the pace—they haul more tons at faster speeds—they reduce ton-mile costs. They speed up the entire railroad and increase net earnings.



LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

in progress on orders for Diesel locomotives, representing an outlay of about \$3,500,000. Construction of this plant, which occupies a 74-acre site on the Indiana Harbor Belt, was started in March, 1935, and completed in about seven months' time by the Austin Company, Cleveland, Ohio.

Train Control Petition Denied

The Interstate Commerce Commission has denied a petition filed by the Lehigh Valley on March 6 for permission to operate backward in automatic train control territory locomotives equipped with apparatus for forward operation only.

Pension Law Arguments to Be Heard May 20

Oral arguments before the supreme court of the District of Columbia on the bill of complaint filed by the railroads attacking the constitutionality of the railroad retirement act of 1935 and the accompanying tax act have now been scheduled for May 20. The railroads had indicated their readiness to present their arguments at a much earlier date but counsel representing the government and the Railroad Retirement Board desired additional time.

Labor-Management Conferences End in Deadlock

Conferences between the committees of railway management and labor, which had been appointed to negotiate an agreement for the protection of employees displaced in consolidation projects, ended in a deadlock at sessions held in New York on April 9. Rejecting there the last offer of the management group, labor turned its attention to Washington, where hearings on the Wheeler-Crosser bill opened on April 13 before the Senate Committee on interstate commerce.

Railway Employment Increased in March

A total of 1,022,693 employees as of the middle of March, an increase of 4.56 per cent as compared with the number in March last year, has been reported to the Interstate Commerce Commission by Class I railroads excluding switching and terminal companies. This figure, however, is a reduction of 0.71 per cent as compared with the number in February, 1936. Employees in train and engine service increased 7.43 per cent as compared with March, 1935, but decreased 0.46 per cent as compared with February.

Long Island Asks Three-Cent Coach Fare

The Long Island has filed a separate petition with the Interstate Commerce Commission asking the commission to postpone its passenger fare order and to allow the Long Island to establish a fare of three cents a mile in coaches. The petition says the Long Island is essentially different from other roads in that it is predominantly a passenger-carrying line, 75 per cent of its revenues being derived from passenger traffic, of which 70 per cent is commutation traffic, and that because of its short-haul it requires a higher passenger fare for other than commutation traffic

than other roads. The company also contends that because of the nature of its territory and the large volume of traffic which it now handles there is no reasonable prospect that a lower fare would produce enough additional revenue to offset the reduction. The company is now experimenting with a round-trip rate of 2.3 cents a mile and wishes to continue the experiment.

Accounting Officers to Meet in Detroit

The first annual meeting of the Accounting Division, Association of American Railroads, successor to the Railway Accounting Officers' Association, will be held at the Book-Cadillac Hotel, Detroit, Mich., July 1 and 2. The usual "open house" committee meetings will be held on June 30. A printed agenda containing committee reports for consideration at the meeting is being prepared by the secretary for distribution prior to the meeting.

P. R. R. Trains to Be Expedited

The Pennsylvania announces that beginning with the new timetable, April 26, the Golden Arrow, leaving New York at 4:10 p.m., will be run through to Chicago in 1 hr. 20 min. less time than at present, arriving at Chicago at 8:45 a.m. It will be a New York-Chicago train intact, with no intermediate switching. The Rainbow, leaving New York at midnight, will go through to Chicago in 1 hr. 25 min. less than at present. Eastbound, the schedule of the Golden Arrow will be cut down 55 min., the train leaving Chicago at 2:30 p.m., one hour later than at present.

Eastern Car Foreman's Association Annual Dinner

The Eastern Car Foreman's Association will hold its annual dinner and floor show at 6:30 p.m., Daylight Saving Time, Thursday, April 30, at Jaeger's Restaurant, Eighty-fifth street and Lexington avenue, New York. Reservations for members and guests should be made with T. P. O'Brien, Room 1777, 50 Church street, New York.

State Commissions Oppose Postponement of Reduced Passenger Fares

The National Association of Railroad and Utilities Commissioners has filed with the Interstate Commerce Commission an answer to the petition of the eastern railroads asking it to postpone the effective date of its order reducing passenger fares. The association asks the commission to deny the postponement asked but says that if it is granted the commission in no event should make an order the effect of which would be to restrict the Baltimore & Ohio from making the proposed reductions and that if any modification is made it should be limited to the carriers that have asked for a change.

North Western Adds Two New Trains

Two mile-a-minute trains will be placed in service by the Chicago & North Western between Chicago and Milwaukee, Wis., and the "400" will be moved forward to 3 p.m. (central standard time) from Chicago northbound and St. Paul southbound

on April 26. A new 90-min. northbound train to Milwaukee will leave Chicago at 8 a.m. (central standard time), arriving in Milwaukee at 9:30, the schedule being 35 min. faster than that of the train now leaving at that hour. The Hi-Noon, a new southbound train, will leave Milwaukee at 12:01 p.m. and will be run to Chicago in 89 minutes. The present 8 a.m. train will be pushed forward to 7 a.m. Train No. 120 southbound will leave Milwaukee at 8:25 p.m. instead of 8:50 and will arrive in Chicago at 10:30 instead of 10:55. This train serves patrons who change from the "400" at Milwaukee on the southbound trip.

New Haven "Cycle Trains"

The New York, New Haven & Hartford on April 26 will operate the first of a series of "cycle trains" from New York to Canaan, Conn. The cycle train, the railroad's bid for the business of those interested in the sport of bicycling, will be equipped with a baggage car stocked with bicycles which can be rented for a nominal charge. Also, bicycles owned by passengers will be carried free of charge. The New Haven has mapped out several routes in the Berkshire territory around Canaan and maps showing the territory and routes will be handed out on the train. The train will leave Grand Central Terminal, New York, at 6:55 a.m. and returning will leave Canaan at 5:32 p.m., arriving in New York at 8:47 p.m.

M. C. Kennedy Resigns from Co-ordinator's Organization

Miles C. Kennedy, eastern regional director for the Federal Co-ordinator of Transportation, has resigned to return to engineering practice with the firm of Coverdale & Colpitts, consulting engineers, New York. Mr. Kennedy left this firm in 1932 to become chief railroad examiner for the newly-created Reconstruction Finance Corporation. When the Eastern Regional Co-ordinating Committee was set up by the Eastern railroads in compliance with the emergency railroad transportation act, he became its executive secretary, later transferring to the Co-ordinator's organization.

Appropriations Proposed for Grade Crossing Elimination

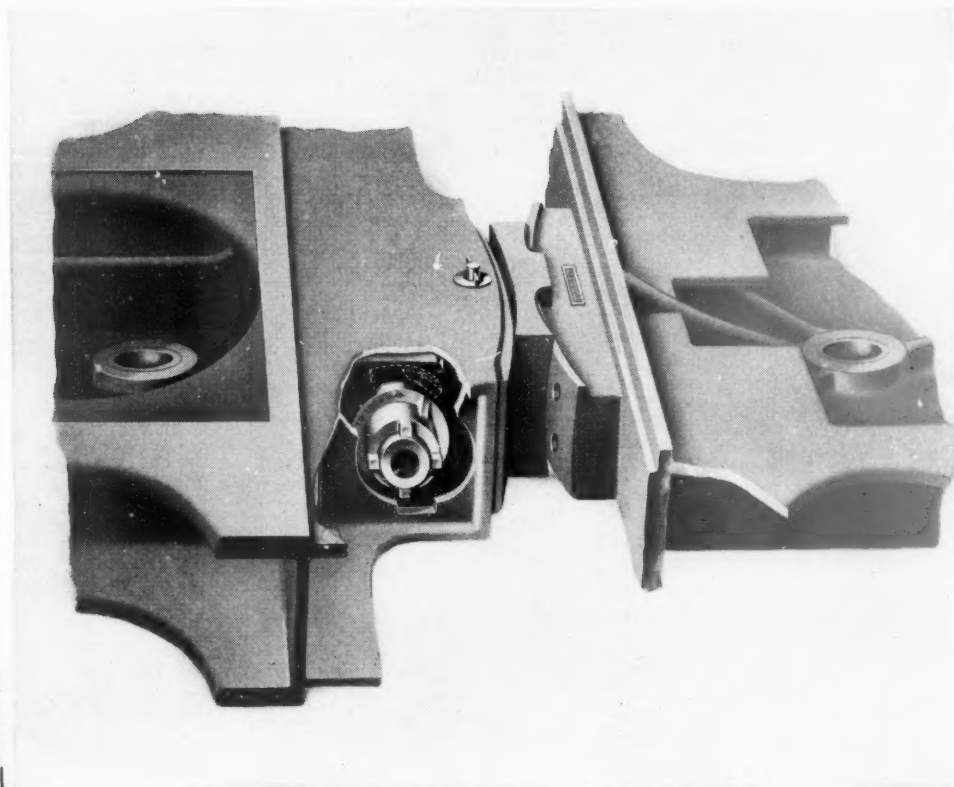
The House committee on roads has favorably reported to the House a bill introduced by Representative Cartwright providing for appropriations for highway improvement, including a provision of \$50,000,000 in each of the fiscal years 1938 and 1939 for the elimination of hazards at grade crossings. A similar bill was introduced in the Senate by Senator Hayden.

Under the pending \$200,000,000 program plans to the amount of \$99,036,000 had been approved by the Bureau of Public Roads up to April 11 and contracts had been awarded to the amount of \$56,343,092, including \$2,193,613 during the week.

I. C. C. to Investigate Freight Forwarding

The Interstate Commerce Commission on April 11 announced an investigation of the

A SAVER



RADIAL BUFFER TYPE E-2

of maintenance money

Radial Buffer Type E-2 principles are correct.

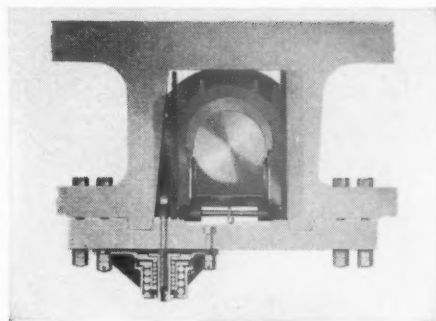
One buffing surface is part of a cylinder—the other, part of a sphere.

The centers of both are where they should be—at the drawbar pins.

Radial Buffer Type E-2 provides positive cushioned contact between engine and tender. It precludes all possibility of slack that causes destructive shocks on drawbar and pins. It guarantees freedom of motion in any direction, yet dampens oscillation between engine and tender.

Its twin, the Franklin Automatic Compensator and Snubber, maintains constant and perfect driving box adjustment.

Both devices improve locomotive operation and greatly reduce locomotive maintenance.

FRANKLIN AUTOMATIC COMPENSATOR
AND SNUBBER

All replacement parts furnished by Franklin Railway Supply Company are identical as to materials, design, clearances and workmanship with the parts they replace. They guarantee the same unfailing reliability of service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

rates, charges, rules, regulations and practices of railroads with respect to the transportation of freight in consolidated carloads and the relationships between the railroads and persons or corporations engaged in the carloading and freight forwarding business. The investigation, according to the commission's order, is to include a full inquiry into the relationship, direct or indirect, between the railroads or any of their officials and those engaged in the carloading or freight forwarding business, tariff provisions, operating practices, accessorial and terminal services, etc.

National Safety Standards Commission Proposed

Senator Loneragan, of Connecticut, has introduced in Congress a bill, S. 4450, to provide for the establishment of a National Safety Standards Commission, to be composed of representatives of the Bureau of Public Roads, the War Department, and the Interstate Commerce Commission, to make investigations, studies, and examinations of various systems, devices, appliances, and methods for the protection of the public and the promotion of safety in the operation of railroads and drawbridges, and in the use of the public highways. Another bill, S. 4451, proposes amendments to Section 26 of the interstate commerce act relating to the installation, inspection, maintenance, and repair of devices for promoting the safety of railroad operation.

Eastern Roads Propose New Pick-Up and Delivery Tariffs

The principal eastern railroads, not including, however, the New York Central, on April 15 filed with the Interstate Commerce Commission a petition asking special permission to publish and file tariffs providing for pick-up and delivery service at station-to-station rates, irrespective of the length of haul, as a substitute for the tariffs suspended by the commission on protests by trucking interests, which were to have been made effective on April 1. The proposed tariffs would not include provision for the allowance of 5 cents per hundred pounds to shippers who desire to perform the service for themselves, nor for the extra charge for shipments beyond 260 miles. The petition was filed, it was stated, "in the hope that they may be allowed, pending the investigation of the propriety of the allowances and other features of the suspended tariffs, to provide a service comparable to that offered by numerous other carriers by rail, by motor vehicle, and by freight forwarding companies, at rates as low or lower than petitioners' station rates."

Pennsylvania's Birthday

The ninetieth birthday of the Pennsylvania Railroad occurred on Monday, April 13, that date in 1846 having witnessed the signature of Governor Shunk of Pennsylvania, to the act of legislature incorporating the company. Following many months' activity in securing subscriptions to stock, the letters patent from the Governor, rendering the act operative, were issued on February 25, 1847. Through all-rail train service between Philadelphia and Pittsburgh was established on December 10, 1852, the president of the road at that time be-

ing John Edgar Thomson, who had been chief engineer during construction. Not, however, until February 15, 1854, did the company run trains through to Pittsburgh all the way over its own rails. Up to that time, use had been made of the Allegheny Portage Railroad, owned by the state, which surmounted the mountains by the use of 11 inclined planes, up which cars were moved by cable. The canals and railroad lines owned by the state were bought by the railroad company in 1857, the railroad paying \$15,000,000 for property which had cost the state over \$40,000,000.

The company has this year paid its 203rd dividend, establishing a record of 89 years of continuous return to its stockholders.

Shippers and Truckers Approve General Principles as to Rates and Costs

A statement of general principles as to the relation of the cost factor to rate-making, adopted at a recent meeting of the conference committee representing shippers, railroads, and truck operators, has been approved by the National Industrial Traffic League and the American Trucking Associations, Inc., and is to be considered by the directors of the Association of American Railroads at an early meeting. The statement of principles follows:

"In so far as costs may be applied to rate-making, the following is recommended, taking such infirmities as there may be into consideration:

1. That either agency should not go below its reasonable cost in its endeavors to attract competitive traffic.
2. That the competitive rates of either agency should reflect not more than its reasonable cost plus a reasonable profit.
3. That each agency should endeavor to obtain a reasonable profit from each of its competitive transactions.
4. That in the relations between carrier agencies and within each group retaliatory methods of a destructive character should not be indulged in.
5. In the adoption of the foregoing principles, the conference in recognition of the varying conditions existing in different parts of the United States has not undertaken to set arbitrary rules for the determination of competitive rate levels or for the ascertainment of costs."

New N. Y. C. Train Schedules

A new train from Chicago to New York, the Water Level Limited, will be put into service by the New York Central on April 26. On that day, with the resumption of Daylight Saving Time, new schedules calling for faster running time for several of the Central's trains will be put into effect.

The Water Level Limited will be operated from Chicago to New York in 17 hrs., 25 min., leaving Chicago at 2:45 p.m., Central Standard Time, (3:45 p.m. Daylight Saving Time) and arriving in Grand Central Terminal at 9:10 a.m., Eastern Standard Time, (10:10 a.m. Daylight Saving Time). The Twentieth Century Limited will remain on its present 16½ hour schedule, but its departure and arrival times will be changed to conform to Daylight Saving Time. The time of the Commodore Vanderbilt, westbound

from New York to Chicago, will be quickened 1 hr., 20 min., making its running time 17 hrs., 35 min. Eastbound, it will be quickened five minutes and only Pullman passengers will be carried. The Iroquois will provide new midnight service from New York to Chicago in 18 hrs., 30 min., 2 hrs., 5 min., faster than heretofore.

The running time of the Detroit, from New York to Detroit, will be cut one-half hour. New day service from New York to Detroit, will be provided on the Empire State Express, on which through tickets to Detroit will be sold. New service from New York to Indianapolis and St. Louis will be provided on the Cleveland Limited. Slight adjustments have been made in the time of several other through trains.

Equipment and Supplies

FREIGHT CARS

THE MISSOURI PACIFIC is inquiring for 1,500 box cars of 50 tons' capacity and 500 self-clearing hopper cars of 55 tons' capacity.

THE WHEELING & LAKE ERIE is building 50 new automobile cars and has work under way on the rehabilitation of disabled cars, in its shop at Toledo, Ohio; 350 men are now employed at this shop.

THE ERIE has placed orders for 800 cars as follows: American Car & Foundry Company, 500 box cars; Magor Car Corporation, 200 automobile cars, and Greenville Steel Car Company, 100 automobile cars, this 100 to be equipped with loaders; all the cars are to be of 50 tons' capacity. Inquiry for this equipment was reported in the *Railway Age* of March 21, page 517.

THE PACIFIC FRUIT EXPRESS has ordered 2,700 refrigerator cars—2,000 from outside builders and 700 from its own shops. Of the 2,000 placed with builders 500 were ordered from each of the following: General American Car Company; American Car & Foundry Company; Pacific Car & Foundry Company; and Pullman-Standard Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of March 14.

PASSENGER CARS

THE NORFOLK SOUTHERN is inquiring for three light-weight passenger coaches, three light-weight passenger and baggage cars, and three light-weight baggage and mail cars.

IRON AND STEEL

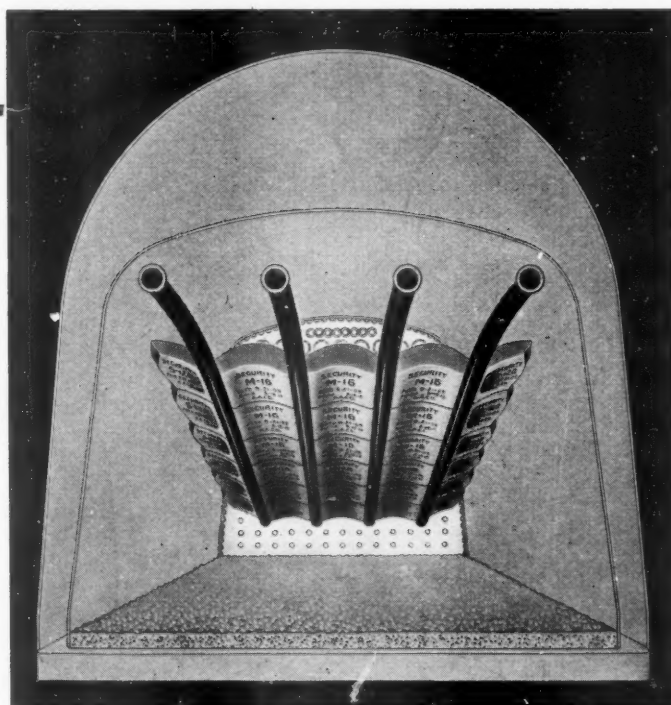
THE BALTIMORE & OHIO has placed orders for 25,000 tons of rail as follows: Carnegie-Illinois Steel Corporation, 10,600 tons of 131-lb. rail and 5,000 tons of 112-lb. rail; Bethlehem Steel Company, 8,400 tons of 131-lb. rail; Inland Steel Company, 1,000 tons of 131-lb. rail.

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MAINTAIN **THE SECURITY ARCH** **100%**

The Security Sectional Brick Arch is universally recognized as a most effective reducer of fuel costs.

Make sure that you are getting all the benefits of the Security Arch by maintaining a full arch at all times.



*There's More To
 SECURITY ARCHES
 Than Just Brick*

**HARBISON-WALKER
 REFRACTORIES CO.**
Refractory Specialists



AMERICAN ARCH CO.
 INCORPORATED
*Locomotive Combustion
 Specialists* * * *

Supply Trade

The offices of **Poor & Company**, have been moved from 165 Broadway to 50 Church street, New York.

The offices of the **Rail Joint Company** have been moved from 165 Broadway to 50 Church street, New York.

The **P. and M. Company** has moved its office from 165 Broadway to 50 Church street, New York.

The office of the **Maintenance Equipment Company** has been moved from 165 Broadway to 50 Church street, New York.

The **G. M. Basford Company**, New York, has moved its branch office from 2717 Koppers building, Pittsburgh, Pa., to 422 Leader building, Cleveland, Ohio.

William M. Roche, formerly vice-president of the Waugh Equipment Company, New York, has been elected vice-president of the **International Supply Company**, Chicago.

Norbert E. Smith, representative of **Joseph T. Ryerson & Son, Inc.**, with headquarters at Indianapolis, Ind., has been appointed sales representative of the **Inland Steel Company**, with headquarters in Chicago.

Ross F. Hayes has been appointed eastern sales agent of the **Railway Utility Company**, Chicago, succeeding **J. H. Denton**, who has represented the company in that territory for the past 23 years. Mr. Hayes will continue his headquarters at 50 Church street, New York.

The **Republic Steel Corporation** has appointed the **Equitable Equipment Company, Inc.**, New Orleans, La., distributor of its ENDURO stainless steel. The **York Corrugating Company**, York, Pa., and the **Sheet Metal Manufacturing Company, Inc.**, Stamford, Conn., have been appointed Toncan Iron sheet distributors. The latter company is a branch of the same firm in Brooklyn, N. Y., which had previously been appointed distributors of Toncan sheets.

Robert T. Woodings, assistant to the president of the **Woodings-Verona Tool Works**, Verona, Pa., has been elected vice-president of that company. Mr. Woodings was born at Pittsburgh, Pa., on November 10, 1901, and graduated from the course of business administration at Bucknell University in 1925. Following graduation he entered the service of the Woodings Forge & Tool Company as an employee in the plant. Two years later he entered the sales staff of this company. Upon the acquisition of the Verona Tool Works in 1931, he was made assistant to the president, which title he has held until his recent promotion.

The **Baldwin Locomotive Works** has submitted to stockholders and bondholders a plan for the reorganization of the company under Section 77B of the Federal Bankruptcy Act. In discussing the proposed plan the notice points out that the

disbursements which the company would be obliged to make, until and including September 1, 1940, for interest and sinking fund requirements on its funded debt, exclusive of any payment that may be required with respect to the coupon on the consolidated mortgage bonds due March 1, 1935, and exclusive of interest charges on any new debt incurred, would be the interest on the first mortgage bonds in the hands of the public amounting to \$133,800 per year. This compares with an annual service charge on its present funded debt of \$1,281,236.

Herbert N. West, manager of engineering and works of the **Weir Kilby Corporation**, Cincinnati, Ohio, has been elected a vice-president and will have charge of engineering and manufacturing at the company's plants in Cincinnati and Birmingham, Ala. Mr. West entered the employ of the Weir Frog Company as a



Herbert N. West

co-operative student six months prior to his graduation in civil engineering from the University of Cincinnati in 1920. He was promoted to chief engineer on October 1, 1921, and thence to chief engineer and works manager on September 1, 1923. In 1925, when the Weir Frog Company was consolidated with the Kilby Frog & Switch Company to form the Weir Kilby Corporation, Mr. West was made manager of engineering and works of the consolidated company, which position he held until his recent election as vice-president.

Correction

John C. Keene instead of F. C. Keene, as reported in the *Railway Age* of April 4, has been appointed sales representative of the **Illinois Railway Equipment Company**.

OBITUARY

Charles D. Jenks, president of the Chicago-Cleveland Car Roofing Company, Chicago, died in San Francisco, Cal., on April 14 following a month's illness.

Major Charles Carothers, formerly representative of the Franklin Railway Supply Company, with headquarters at Chicago, died in that city on March 30 of angina pectoris.

Financial

BESSEMER & LAKE ERIE.—Annual Report.—The 1935 annual report for this company shows net income, after interest and other charges, of \$2,425,497, as compared with net income of \$817,754 in 1934. Selected items from the Income Account follow:

	1935	1934	Increase or decrease
RAILWAY OPERATING REVENUES	\$9,828,106	\$8,304,765	+\$1,523,341
Maintenance of way	1,077,301	1,161,232	-83,931
Maintenance of equipment	3,073,658	3,356,708	-283,050
Transportation	1,846,269	1,702,604	+143,664
TOTAL OPERATING EXPENSES	6,501,024	6,810,295	-309,271
Operating ratio	66.15	82.00	-15.85
NET REVENUE FROM OPERATIONS	3,327,082	1,494,470	+1,832,612
Railway tax accruals	727,607	382,902	344,705
Railway operating income	2,599,464	1,111,551	+1,487,912
Equipment and joint facility rents—net	303,194	135,590	+167,603
NET RAILWAY OPERATING INCOME	2,902,658	1,247,141	+1,655,516
Total other income	78,564	126,501	-47,936
TOTAL INCOME	2,981,223	1,373,643	+1,607,579
Rent for leased roads	5,953	5,972	-19
Interest on funded debt	516,650	524,133	-7,483
TOTAL FIXED CHARGES	523,767	530,143	-6,376
NET INCOME	\$2,425,497	\$817,754	+\$1,607,743

BOSTON & MAINE.—R.F.C. Loan.—Chairman Jesse H. Jones of the Reconstruction Finance Corporation has announced that, subject to Interstate Commerce Commission approval, the corporation has agreed to make a loan of \$2,000,000 to this company to repair damages to its property caused by recent floods.

BOSTON & MAINE.—Annual Meeting.—At the annual meeting of this company last week, stockholders authorized the creation of an equipment trust of not more than \$4,000,000 for the acquisition of new rolling stock. They also authorized the issue of \$11,680,000 of bonds to reimburse the treasury for issues already matured and paid, or to be paid.

CHICAGO & EASTERN ILLINOIS.—Attorney's Fees.—The Interstate Commerce Commission has authorized payment of \$7847 to E. S. Ballard for legal services and expenses in connection with the reorganization of this property, without prejudice as to further allowances after investigation. Mr. Ballard sought \$10,000 and expenses.

CHICAGO & NORTH WESTERN.—Abandonment.—The trustee of this property has been authorized by the Interstate Commerce Commission to abandon a branch extending from a point near Survey station 28 + 57 to the end of track at Winegar, Wis., 19 miles, together with a 1.4-mile spur line.

CHICAGO & NORTH WESTERN.—Annual Repo. The 1935 annual report of this

Continued on next left-hand page

THE SUPERHEATER COMPANY

NEW YORK



CHICAGO

REMANUFACTURED
SUPERHEATER UNITS ARE
PAINTED RED

to distinguish them from new superheater units



NEW YORK
60 East 42nd St.

MONTREAL
The Superheater Co., Ltd.
Dominion Square Bldg.

CHICAGO
Peoples Gas Bldg.

REPRESENTATIVE OF AMERICAN THROTTLE COMPANY, INC.

company shows net deficit, after interest and other charges, of \$11,070,348, as compared with net deficit of \$8,276,193 in 1934. Selected items from the Income Account follow:

	1934	1935	Increase or decrease
Average Mileage Operated	8441.27	8421.89	-19.38
RAILWAY OPERATING REVENUES	\$75,893,418	\$77,345,495	+\$1,452,077
Maintenance of way	10,776,858	12,427,546	+1,650,687
Maintenance of equipment	15,528,401	16,803,416	+1,275,014
Transportation	29,403,294	30,591,667	+1,188,372
TOTAL OPERATING EXPENSES	61,811,819	65,348,579	+3,536,759
Operating ratio	81.45	84.49	+3.04
NET REVENUE FROM OPERATIONS	14,081,598	11,996,916	-2,084,681
Railway tax accruals	6,106,055	5,391,572	-714,482
Equipment rents—net	2,538,017	2,795,651	+257,633
Joint facility rents—net	216,748	200,730	-16,018
NET RAILWAY OPERATING INCOME	5,202,104	3,578,483	-1,623,621
Non-operating income	3,337,741	2,373,455	-964,286
GROSS INCOME	8,539,846	5,951,938	-2,587,907
Rent for leased roads	3,047	3,440	+393
Interest on funded debt	15,723,887	15,511,456	-212,431
TOTAL FIXED CHARGES	16,764,992	16,961,779	+196,786
NET DEFICIT	\$8,276,193	\$11,070,348	+\$2,794,154

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust*.—The Interstate Commerce Commission has authorized this company and its trustees to issue \$3,840,000 of series O, 4 per cent equipment trust certificates, to be sold to the Reconstruction Finance Corporation at par, to cover 80 per cent of the construction costs of new equipment. The certificates will mature in 10 annual installments.

DULUTH, SOUTH SHORE & ATLANTIC.—*Annual Report*.—The 1935 annual report of this company shows net deficit, after interest and other charges, of \$559,821, as compared with net deficit of \$827,144 in 1934. Selected items from the Income Statement follow:

	1935	1934	Increase or decrease
Average mileage operated	556.30	557.03	-0.73
RAILWAY OPERATING REVENUES	\$2,360,044	\$2,176,536	+\$183,508
Maintenance of way	404,273	354,595	+49,678
Maintenance of equipment	406,180	425,252	-19,072
Transportation	928,285	896,603	+31,682
TOTAL OPERATING EXPENSES	1,835,246	1,808,780	+26,466
Operating ratio	77.76	83.10	-5.34
NET REVENUE FROM OPERATIONS	524,798	367,756	+157,042
Railway tax accruals	57,121	121,764	-64,643
Railway operating income	467,409	245,726	+221,683
Hire of equipment—Net Dr.	75,675	76,411	-736
Joint facility rents—Net Dr.	22,143	30,720	-8,577
NET RAILWAY OPERATING INCOME	369,590	138,595	+230,995
Non-operating income—Net	* 5,915	† 26,839	+32,754
Interest on funded debt	935,326	938,899	-3,573
NET DEFICIT	\$559,821	\$827,144	-\$267,323

* Credit. † Debit.

FLORIDA EAST COAST.—*Sale of Equipment under Trust*.—Albion W. Knight, special master appointed pursuant to a final decree of the federal district court for Southern Florida in suit by the Bankers Trust Company as trustee under equipment trust certificates of this company, has announced a sale of equipment under the trust as follows: 20 road locomotives, 5 switch locomotives, 3 passenger coaches, 196 box cars, 19 cabooses and 91 ballast cars. The sale will be held on April 29 at the office of the railway in St. Augustine.

LOUISIANA & ARKANSAS.—*Equipment Trust*.—The Interstate Commerce Commission has authorized this company to assume liability for \$900,000 of 3¾ per cent equipment trust of 1936 certificates, maturing 1936-46. The certificates are authorized for sale to the highest bidder—Boenning & Co. and Chandler & Co. of Philadelphia at 98.88, making the interest cost to the railroad approximately 4 per cent.

MISSOURI PACIFIC.—*Reorganization Plan*.—Hearings on the reorganization plan proposed by the company were resumed at Washington on April 14 before Oliver E. Sweet, director of the Bureau of Finance of the Interstate Commerce Commission. William Wyer, secretary and treasurer, was recalled for cross-examination on his testimony and exhibits introduced at the previous hearing.

MISSOURI PACIFIC.—*Seeks to Recover \$3,200,000*.—The trustee of this company has brought suit in the federal court at New York seeking to recover \$3,200,000 which it deposited with the Guaranty Trust Company in 1930 under contract involving the purchase of securities of terminal properties in Kansas City, Mo., and St. Joseph, from Terminal Shares, Inc. Judge Faris of the federal court in St. Louis disapproved this contract and authorized the trustee to take legal steps to recover the amount deposited, plus interest.

NEW YORK, NEW HAVEN & HARTFORD.—*Annual Meeting*.—Arthur E. Clark, secretary of the company, was elected to the directorate at its annual meeting, April 15. Chairman E. G. Buckland pointed out the uncertainty as to the company's income position in the future because of the Guffey Act and the proposed reduction in passenger fares; and stated that for this reason a postponement would be sought in the time for filing a plan of reorganization.

NORTHERN PACIFIC.—*Annual Meeting*.—President Charles Donnelly told the stockholders at the annual meeting on April 14 that the management was considering refunding at a lower rate of interest \$105,959,000 of 6 per cent refunding and improvement mortgage bonds, due 2047, which are callable after July 1 at 110.

PENNSYLVANIA.—*Annual Meeting*.—A. J. County, vice-president, told stockholders at the annual meeting on April 14 that flood damage to the property might reach a total of \$8,500,000, exclusive of a loss in revenues of \$4,000,000 due to interruption of the service. Mr. County expressed regret at the action of the Interstate

Commerce Commission in suspending tariffs for free collection and delivery of local freight which the railroads in the East were to have put into effect on April 1. Commenting on recent refunding of bond issues at lower interest rates, he said that a study was being made of the opportunities for similar operations by companies in which the Pennsylvania was interested. The stockholders authorized the directors to increase the company's indebtedness by \$75,000,000. He also pointed out that the company had \$2.74 of assets for every dollar of funded debt outstanding. Effingham B. Morris, chairman of the board of the Girard Trust Company, who presided, called attention of the stockholders to the death last year of General W. W. Atterbury, former president, and called for a rising tribute to his memory.

PEORIA & PEKIN UNION.—*Annual Report*.—The 1935 annual report of this company shows net income, after interest and other charges, of \$113,470, as compared with net income of \$98,739 in 1934. Selected items from the Income Account follow:

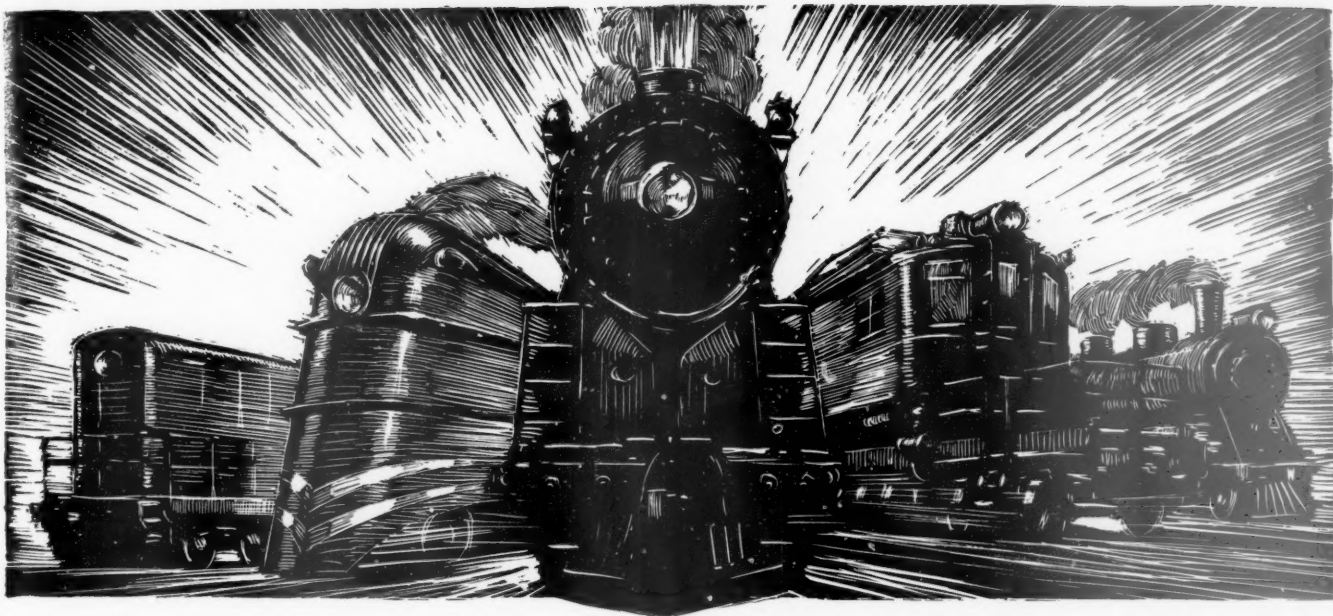
	1935	1934	Increase or decrease
RAILWAY OPERATING REVENUES	\$1,004,414	\$919,883	+84,531
TOTAL OPERATING EXPENSES	828,938	754,806	+74,132
Operating ratio	.....	.....	.....
NET REVENUE FROM OPERATIONS	175,475	165,076	+10,399
Railway tax accruals	105,108	102,941	+2,167
Railway operating income	70,365	62,128	+8,236
Hire of freight cars—Dr.	19,187	25,296	-6,109
NET RAILWAY OPERATING INCOME	264,888	247,835	+17,052
Non-operating income	22,694	28,666	-5,972
GROSS INCOME	287,582	276,502	+11,080
Rent for leased roads	1,500	1,500	.....
Interest on funded debt	167,842	171,085	-3,242
TOTAL DEDUCTIONS FROM GROSS INCOME	174,112	177,763	-3,650
NET INCOME	\$113,470	\$98,739	+\$14,731

PITTSBURGH & WEST VIRGINIA.—*Equipment Trust Certificates*.—This company has applied to the Interstate Commerce Commission for authority to sell \$2,000,000 of 3½ per cent equipment trust certificates, the proceeds to be used to retire \$660,000 of outstanding equipment trust certificates bearing interest at 4½ per cent and reduce its indebtedness to the Reconstruction Finance Corporation, the Railroad Credit Corporation, and various banks.

SOUTHERN PACIFIC.—*Release of Collateral*.—The Interstate Commerce Commission has approved the release by the Reconstruction Finance Corporation of \$4,737,000 of El Paso & Southwestern 5 per cent first and refunding bonds of 1965 deposited by the Southern Pacific as collateral security for loans totaling \$22,000,000. The reduction in collateral follows reduction of this loan to \$17,000,000. The railroad had sought the release of additional collateral totaling \$10,900,000, principal amount.

SOUTHERN.—*R.F.C. Loan*.—The Interstate Commerce Commission, Division 4, has approved an additional loan to this

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CONFIDENCE

Webster:

"Sentiment suggests a more or less settled opinion, often, but not necessarily, with reference to something which involves one's feelings.

Opinion is what one thinks or believes about something; the word does not imply the definiteness or weight of a judgment, or the assurance or certainty of a conviction."

WE build steam, Diesel-electric, or electric power-units, — whichever the problem at hand demands. . . . Our recommendations therefore are devoid of **sentiment**; they definitely are not an **opinion**; they have the necessary background to carry assurance and the certainty of conviction. . . . Being builders of all classes of railway motive power, there can be no suspicion of a possible biased interest.

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company by the Reconstruction Finance Corporation of \$4,859,000 for the purpose of retiring at maturity on May 1 a like amount of general mortgage 5 per cent bonds of the Virginia Midland. The commission also authorized the authentication and delivery of \$4,859,000 of first consolidated mortgage bonds to be pledged as collateral for the additional loan.

UNION PACIFIC.—Bonds.—With a view to a reduction in interest charges this company has applied to the Interstate Commerce Commission for authority to issue \$26,835,000 of 35-year 3½ per cent debenture bonds, which had been sold to Kuhn, Loeb & Co., at 97 and interest, subject to approval, the proceeds to be applied to the payment of a like amount of 40-year 4½ per cent bonds to be called on July 1. Provision is made for sinking fund payments annually equal to one-half of one per cent or the net income for the preceding calendar year.

WHEELING & LAKE ERIE.—Prior Lien Dividend.—A dividend of \$2.62½ has been declared on this company's prior lien stock covering the arrearages December 16, 1930, to April 30, 1931. Holders of this stock elect a majority of the board of directors as long as dividends on it are five years in arrears, as they still are even with the present declaration.

Average Prices of Stocks and of Bonds

	Apr. 14	Last week	Last year
Average price of 20 representative railway stocks..	49.08	49.06	30.87
Average price of 20 representative railway bonds..	80.26	80.95	72.33

Dividends Declared

Atlantic Coast Line.—Preferred, \$2.50, semi-annually, payable May 11 to holders of record April 24.

Northern R. R. of New Hampshire.—\$1.50, payable April 30 to holders of record April 13.

St. Louis, Rocky Mt. & Pacific.—Preferred, \$1.25 payable June 30.

Construction

LEHIGH VALLEY.—An order amending the method of eliminating the Schoolhouse and Burtt's crossings of this road in the town of Ithaca, N. Y., has been adopted by the New York Public Service Commission. The amended plan provides for placing the highway above the Lehigh on a straight line between a point west of the railroad and a junction with the existing highway near the entrance to the State Park; the estimated cost of \$196,800 will be reduced to about \$132,200 by work to be carried out by the Department of Public Works but the cost to the railroad company may be increased under the new plan.

WABASH.—This company has awarded a contract to the Ross & White Company, Chicago, for the design and construction at Pattonsburg, Mo., of a structural steel, automatic, electric locomotive coaling plant.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

B. G. Stackhouse has been appointed commerce attorney of the Chicago, Indianapolis & Louisville, with office at Chicago.

G. W. Danner, assistant auditor of the Texas & Pacific, has been promoted to auditor, with headquarters as before at Dallas, Tex., succeeding **A. J. Biard**, deceased. **F. R. Latimer**, auditor of disbursements, has been appointed assistant auditor, to succeed Mr. Danner. **A. L. McClelland** has been appointed auditor of disbursements to replace Mr. Latimer.

OPERATING

W. E. Welch has been appointed general manager of the Missouri & Arkansas, with headquarters at Harrison, Ark.

J. P. Shea, assistant trainmaster on the Columbus division of the Pennsylvania, has been transferred to the Indianapolis division, with headquarters at Indianapolis, Ind.

A. B. Warner, operating officer of the Chicago, Rock Island & Gulf (Texas affiliate of the Chicago, Rock Island & Pacific), with headquarters at Ft. Worth, Tex., has retired because of ill health and has been succeeded by **A. E. Walker**, general superintendent of the Rock Island at El Reno, Okla. **C. B. Pratt**, superintendent of the Cedar Rapids-Dakota division of the Rock Island, with headquarters at Cedar Rapids, Iowa, has been promoted to general superintendent at El Reno, to replace Mr. Walker. **C. C. Cunningham**, division engineer of the Kansas-St. Louis division at Kansas City, Mo., has been promoted to superintendent at Cedar Rapids, to succeed Mr. Pratt.

TRAFFIC

O. K. Daly, traveling freight agent on the Grand Trunk at Toledo, Ohio, has been appointed general agent at Birmingham, Ala., succeeding **H. W. Seale**, who has been transferred to Cleveland, Ohio, to replace **F. A. Shaw**, who has retired.

G. U. Yager, traveling passenger agent for the Louisville & Nashville at Pittsburgh, Pa., has been appointed general agent at Chicago, succeeding **H. E. Porter**, who has been appointed division passenger agent at Cincinnati, Ohio.

M. J. Ormond, whose appointment as freight traffic manager of the Lehigh Valley, with headquarters at New York, was noted in the *Railway Age* of March 28, was born at Natick, Mass., and received his education at Natick High School and Chandler School, Boston, Mass. Mr. Ormond entered railroad service with the

Minneapolis, St. Paul & Sault Ste. Marie as clerk in March, 1905. He was appointed traveling freight agent, Blue Ridge Dispatch (Chesapeake & Ohio) in July, 1906. In April, 1909, he entered the service of the Lehigh Valley and on April 16, 1910, he was appointed traveling freight agent; on December 16, 1914, he became commercial agent and on June 1, 1916, general agent. Mr. Ormond was appointed assistant manager Lighterage Department, United States Railroad Administration, at New York, on February 1, 1918, and on July 15, 1919, foreign freight agent. He became general eastern freight agent for the Lehigh Valley at New York in July, 1920, and on March 1, 1930, he was appointed assistant freight traffic manager, the position he held until his recent appointment as freight traffic manager.

Albert C. McIntyre, whose appointment as freight traffic manager of the Lehigh Valley, with headquarters at New York, was noted in the *Railway Age* of March 28, was born on December 31, 1888, at Hyde Park, Boston, Mass., and received his education in the local elementary and high schools. He entered railway service in 1903 as clerk with the New York,

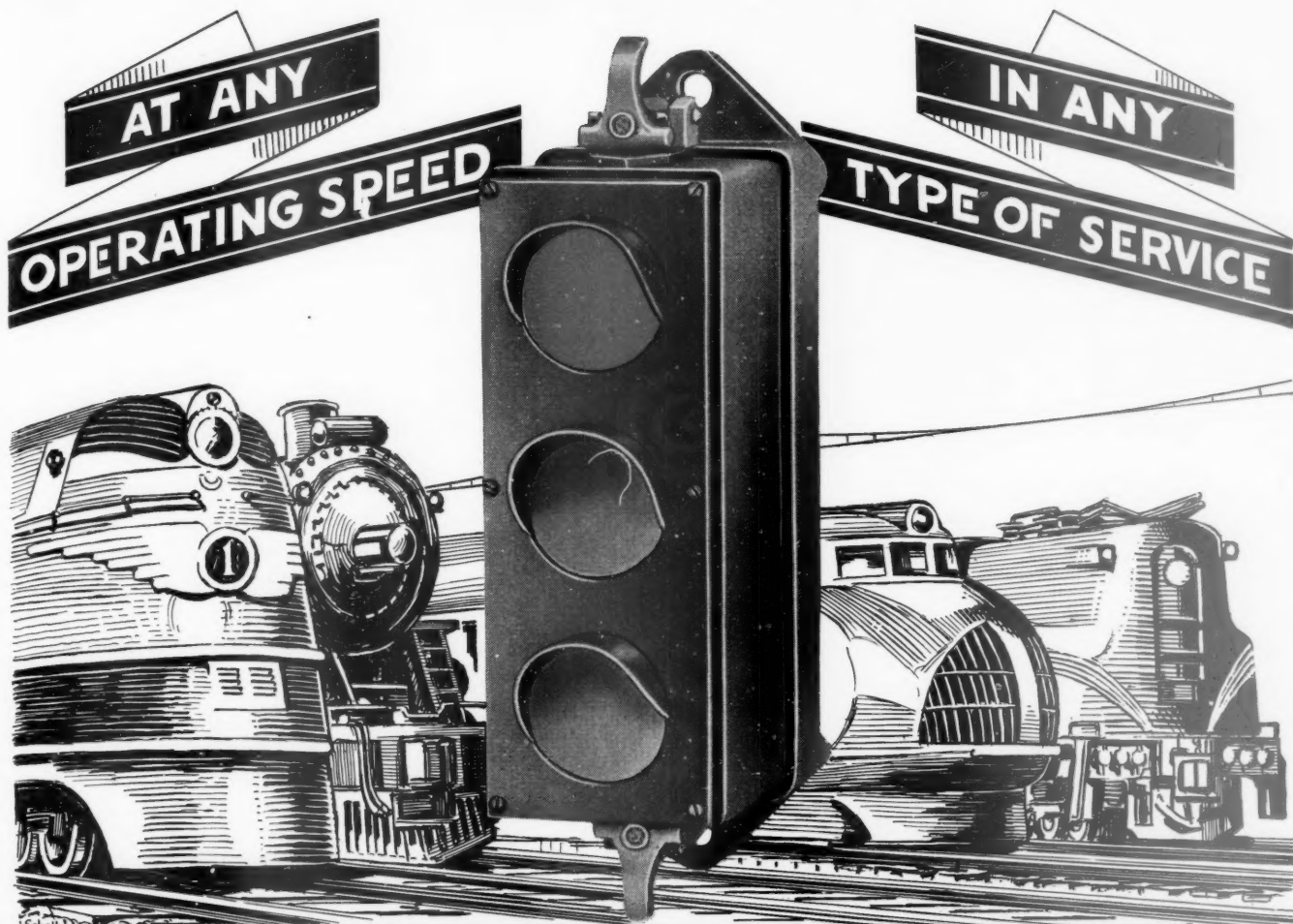


Albert C. McIntyre

New Haven & Hartford at Boston, and later became rate clerk in the general freight office. In 1910 Mr. McIntyre went to the Lehigh Valley as chief clerk in the office of the New England freight agent at Boston, Mass., and in 1915 he was appointed soliciting freight agent at Boston. Shortly thereafter he was transferred to the Chicago office of the Lehigh Valley in the same capacity and in 1917 he became commercial agent at Toledo, Ohio. Mr. McIntyre was then transferred to the office of the assistant general freight agent at Buffalo, N. Y., and in 1918 he became chief clerk to general freight agent at New York. In January, 1920, he was appointed city freight agent at New York and in July, 1920, assistant to the traffic manager. He became assistant general freight agent in 1921 and general freight agent in 1925. Mr. McIntyre was appointed assistant freight traffic manager at New York in 1930, which position he held until his recent appointment as freight traffic manager.

George Morton, who retired on April 1 as freight traffic manager of the Chi-

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tions ahead, regardless of train position in the block. » » » » » » » »

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ago, Burlington & Quincy, with headquarters at Chicago, after 53 years of service with this company, was born on March 21, 1866, at Burlington, Iowa. Mr. Morton first entered railway service in 1883 as a clerk in the general freight office of the



George Morton

Burlington & Missouri River (now part of the Burlington), serving with this company consecutively as a rate clerk, secretary to general freight agent and chief clerk until 1900. In that year, Mr. Morton was appointed assistant general freight agent on the Burlington at Chicago, which position he held for the next 20 years. In 1920, Mr. Morton was advanced to assistant freight traffic manager and in 1929 he was further promoted to freight traffic manager, the position he was holding at the time of his retirement.

Wilmer G. Wagner, assistant freight traffic manager of the Chicago, Burlington & Quincy, who has been promoted to freight traffic manager, with headquarters as before at Chicago, has been connected with this company continuously for 53 years. He was born at Constantine, Mich., on May 26, 1866, and entered railway service with the Burlington in 1883 as a West-



Wilmer G. Wagner

ern Union messenger at Shenandoah, Iowa. He served in this position and as a baggage master, operator and agent at various stations on the Creston division until 1901, when he was appointed freight agent at Burlington, Iowa, being advanced to commercial agent at Des Moines, Iowa, in

1904. Three years later Mr. Wagner was further promoted to division freight agent, with the same headquarters, which position he held until 1912, when he was made assistant general freight agent. In 1920, Mr. Wagner was again promoted to general freight agent and in 1925 he was further advanced to assistant freight traffic manager, holding this position until his recent promotion to freight traffic manager.

R. B. Battey, coal traffic manager of the Chicago, Burlington & Quincy, who has been promoted to assistant freight traffic manager, with headquarters as before at Chicago, was born on January 9, 1885, at Chicago. Early in his career Mr. Battey spent a number of years with various commercial concerns, during which time he acquired a business college education. He entered railway service in 1905 as a stenographer in the operating department of the Pennsylvania at Chicago, serving with this company until 1907, when he entered the service of the Burlington as a stenographer and clerk in the passenger department at Chicago. In 1917, Mr. Battey was appointed chief clerk in the office of the vice-president in charge of traffic,



R. B. Battey

serving as office manager in the federal manager's office during the period of federal control of the railroads. In 1919, he was appointed assistant general freight agent in charge of coal traffic, his title being changed to coal traffic manager in 1921.

Dean E. McKee, assistant general freight agent on the Chicago, Burlington & Quincy, who has been appointed general freight agent, with headquarters as before at Chicago, was born on February 7, 1890, at Lathrop, Mo., and received his higher education at Missouri Wesleyan college (now merged with Baker university). He entered railway service with the Burlington at Louisiana, Mo., in 1908, continuing in various clerical capacities in the traffic department and in station service until the outbreak of the World War. Mr. McKee joined the United States Army and served overseas with the 128th field artillery. Following the war he returned to the Burlington as chief clerk to the assistant general freight agent at St. Joseph, Mo., holding this position until April, 1922, when he was assigned to the general traffic department at Chicago, being appointed

assistant in the commerce department in 1923. On January 1, 1925, Mr. McKee was further advanced to chief clerk to the freight traffic manager and on September



Moffett

Dean E. McKee

1, 1928, he was promoted to assistant general freight agent, the position he was holding at the time of his recent appointment as general freight agent.

ENGINEERING AND SIGNALING

G. R. Haworth, division engineer of the Western Maryland, with headquarters at Cumberland, Md., has been appointed engineer maintenance of way, with headquarters at Baltimore, Md., succeeding **C. B. Hoffman, Jr.**, who has been assigned to other duties.

A. H. Morrill, assistant chief engineer of the Boston & Maine and the Maine Central, with headquarters at Portland, Me., has been appointed acting chief engineer of these roads. **William J. Backes**, chief engineer, has been granted a leave of absence on account of ill health.

SPECIAL

H. J. Schulthess has been appointed chief of personnel of the Denver & Rio Grande Western, with headquarters at Denver, Colo. This is a newly-created position.

OBITUARY

J. E. Ingling, supervisor of fuel and locomotive operations for the Erie, with headquarters at Cleveland, Ohio, died on April 14 at Patterson Hospital, Patterson, N. J., after an illness of several weeks.

William H. Smith, assistant general freight agent for the Northern Pacific at Minneapolis, Minn., died at his home at that point on April 10 at the age of 66 years.

Richard Walsh McEwan, president and chief engineer of the Morristown & Erie, with headquarters at Whippany, N. J., died on April 15 at his home in that city of a heart attack. He was 70 years old.